EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE

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Dr AMANDEEP KAUR

DEPARTMENT OF PAEDIATRICS
DAYANAND MEDICAL COLLEGE & HOSPITAL
LUDHIANA, PUNJAB-141001

DECLARATION BY THE CANDIDATE

I hereby declare that the thesis entitled "**EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE**" submitted towards partial fulfillment of the requirements for the award of **MD in Paediatrics** degree to BFUHS is a compilation of original work carried out by me under the supervision **Dr. Gurdeep Singh Dhooria**, Professor, Department of Paediatrics and **Dr. Puneet A Pooni**, Professor & Head, Department of Paediatrics. No part of this thesis has formed the basis for the award of any degree previously.

_____

Dr. Amandeep Kaur
MD Resident
Dept. of Paediatrics
DMC & Hospital,
Ludhiana

Date:

Place:

CERTIFICATE OF SUPERVISORS

This is to certify that the work incorporated in this thesis entitled "**EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE**" has been carried out by **Dr. Amandeep Kaur** under our direct supervision. The data incorporated in this thesis is original and genuine and has been carried out by the candidate herself.

Signature of Supervisor

Dr. Gurdeep Singh Dhooria
Professor,
Department of Paediatrics
DMCH, Ludhiana

Signature of Co-Supervisor

Dr.Puneet A Pooni
Professor & Head
Department of Paediatrics
DMCH, Ludhiana

Date:

ENDORSEMENT BY THE HEAD OF THE INSTITUTE

This is to certify that the thesis "**EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE**" is a bonafide research work done by **Dr. Amandeep Kaur** under the supervision **Dr. Gurdeep Singh Dhooria**, Professor, Department of Paediatrics and **Dr. Puneet A Pooni**, Professor & Head, Department of Paediatrics in this institution.

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MD Resident
Dept. of Paediatrics,
DMC & Hospital,
Ludhiana

Date:

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Dedicated

to

My Family,

friends

&

Teachers

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Dr. Amandeep Kaur

ABBREVIATIONS

DENV	Dengue virus
WHO	World Health Organization
CFR	Case fatality rate
DHF	Dengue hemorrhagic fever
DSS	Dengue Shock syndrome
HAES	Hydroxyethyl- starch
SAFE	Saline versus Albumin fluid Evaluation
ALBIOS	Albumin Replacement in Patients with Severe Sepsis or study Septic Shock study
ST	Standard treatment
PICU	Paediatric Intensive care unit
AKI	Acute Kidney Injury
NIV	Non-Invasive Ventilation
ED	Emergency department
PFB	Positive fluid balance
PRISM	Paediatric Risk of mortality

ABSTRACT

INTRODUCTION: - Around 100 million cases of Dengue Fever and half a million cases of severe Dengue are estimated to occur annually. Most dreaded complication of Dengue infection is vasculopathy presenting as a systemic vascular leak syndrome. 25% Albumin can help to reduce the extravasation because it can increase oncotic pressure and maintain intravascular volume, thus can prevent worse outcome.

AIM and OBJECTIVES: - To determine if initial fluid resuscitation with 25% Albumin in addition to standard treatment as per WHO improve survival in patients with severe dengue.

Type- Ambispective interventional nonrandomized study.

Material & Methods- The present study was conducted among severe Dengue patients aged 1 month to 18 years old, admitted in DMCH from 2019 to 2023.Categorized into 2 groups equally. (ST plus)(n=25) who receive Albumin infusion (0.5-1 gm/kg) along with standard treatment as per WHO guidelines. (ST ONLY) (n=25) who receive standard treatment as per WHO guidelines. Demographic data, course and outcome were reviewed.

RESULT: - Total 50 patients were included in study. Baseline characteristics were comparable among groups.

Conclusion: - Patient who receives albumin infusion has 20% better survival than those who receive only standard treatment as per WHO guidelines. This intervention could be useful as it decreases the need for NIV and inotropes.

Key words- Severe Dengue, Albumin.

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BABA FARID UNIVERSITY OF HEALTH SCIENCES
Sadiq Road, Faridkot-151203 (Pb.) INDIA
Phone No. 91-1639-256253 and Fax No. 91-1639-256234
Website: www.bfuhs.ac.in, Email: bfuhspc@gmail.com
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INTRODUCTION

Arbovirus infections represent a serious public health problem. They are often associated with epidemics resulting in serious economic and social impact in several regions of world. Dengue virus (DENV) is one of the most important arboviral pathogen. It is transmitted to humans through the bites of infected Aedes mosquitoes principally Aedes aegypti, which is widely distributed mosquito species around the tropical and subtropical regions of the world.

One modelling estimate places the global burden of dengue at 390 (95% credible interval 284–528) million infections per year, of which 96 (67–136) million manifests with varying levels of disease severity [1]. Case fatality rates (CFR) of approximately 1% have been reported for the World Health Organization (WHO) Southeast Asia region; in India, focal outbreaks away from urban areas have reported CFR of 3% – 5%. [2]

Dengue is an endemic arboviral disease affecting around 2.5 billion people of more than 100 countries in tropical and subtropical regions including Southeast Asia. Fifty to hundred million cases of dengue occur worldwide every year (WHO, 2009). [3] Infection with DENV causes a wide spectrum of disease manifestations, ranging from in apparent infection to severe and potentially fatal disease [4] (Gubler, 1998).

DENV belong to genus Flavivirus and family Flaviviridae.

There are 4 serotypes of dengue virus, all of which may produce either a nonspecific febrile illness, dengue fever or may result in severe manifestations of DHF. Dengue Hemorrhagic fever has been graded according to severity by criteria adopted by the World Health Organization. Grade I and II involve only mild capillary leakage,

insufficient to result in the development of shock, and are differentiated by the absence (grade I) or presence (grade II) of spontaneous bleeding. In grade III circulatory failure occurs, manifested by rapid, weak pulse, with narrowing of pulse pressure to <20mmHg; in grade IV shock is severe with no detectable pulse or blood pressure. DHF grades III and IV are collectively referred as DSS. [5] Dengue shock syndrome (DSS; DHF grades III and IV) is the major cause of hospital admission of children in many parts of Southeast Asia, particularly during rainy season. mortality rates for DHF/DSF are quoted from <1% to 5% [6] But rates up to 44% have occasionally been reported with regard to established shock. [7]

In 2009, WHO revised Dengue case classification [8] as -

Dengue without warning signs: -A presumptive diagnosis of dengue infection may be made in the setting of residence in or travel to endemic area plus fever and two of the following: -

- Nausea/vomiting
- Rash
- Headache, eye pain, muscle ache or joint pain.
- Leukopenia
- Positive Torniquet test.

Dengue with warning signs: - Dengue infection in addition to any of the following: -

- Severe Abdominal tenderness or pain
- Evidence fluid accumulation
- Persistent vomiting
- Mucosal bleeding
- Lethargy & Restlessness
- Hepatomegaly >2cm
- Rising hematocrit associated with rapidly falling platelet count.
- **Severe Dengue**- Dengue infection with at least one of the following: -
- Severe plasma leakage leading to

- Shock
- Fluid collection with respiratory compromise
- Severe bleeding
- Any Organ impairment
- AST or ALT ≥1000 units/L
- Impaired Consciousness
- Organ failure

Dengue has a wide clinical spectrum that includes both severe and non-severe clinical manifestations. After the incubation period illness begins abruptly and is followed by 3 phases [9] - Febrile, Critical and Recovery phase.

Febrile phase- Characterized by high grade fever accompanied by headache, vomiting, myalgia, arthralgia and a transient macular rash. This phase lasts for 3-7 days, after which most of the children recover without complications. Additional manifestations may include gastrointestinal symptoms (anorexia, nausea, vomiting, abdominal pain and diarrhea) or respiratory tract symptoms (Cough, sore throat and nasal congestion).

Critical phase: - majority of infections that progress to critical phase result from second DENV infections that occur more than 18 months after a resolved first infection. Around the time of defervescence these patients develop a systemic vascular leak syndrome characterized by plasma leakage, bleeding, shock, and organ impairment. Critical phase lasts for 24 to 48 hours.

RECOVERY PHASE – During the recovery phase, plasma leakage and hemorrhage resolve, vital signs stabilize and accumulated fluids are resorbed. Rash may appear during recovery phase.

Primary pathogenesis associated with development of severe dengue shock is increased capillary permeability either due to direct effect of virus or under the effect of cytokines, resulting in leakage of plasma

into extra vascular space and compromising the intravascular compartment. Increased capillary permeability is due to underlying endothelial cell dysfunction. [10] Dengue virus infect human endothelial cells, to activate cells through toll like receptor 4 signaling, to induce endothelial permeability and disrupt glycocalyx. [11]

Other studies have found that various circulating factors induce the transient increase in capillary permeability. Most important mediators are TNF-a, IF-Gamma, IL-2, IL-8, VEGF and complement. [12]

In some cases, there is massive loss of fluid and as a result shock develops.

The pulse pressure (difference between systolic and diastolic pressure) is a critical determinant of the severity of ongoing plasma vascular leakage. Before overt shock develops, the diastolic BP starts rising and the pulse pressure narrows down. According to WHO, Dengue shock syndrome, is characterized by a pulse pressure of less than 20 mmHg.

Usually between 3rd to 5th day of illness, narrowing of pulse pressure is recognized as one of the earliest manifestations of shock, and occurs before the development of hypotension[13].Hemoconcentration, which is defined as a 20% increase in hematocrit, is now widely used as an indicator of plasma leakage along with pulse pressure. The severity of plasma leakage has been also shown to correlate with the decline in platelet counts.

Typically, Severe Dengue shock develops suddenly following period of defervescence. Plasma volumes continue to fall during the febrile period and reach a nadir during the initial 2 days of convalescence, gradually as the fever subsides. The gradual loss of plasma eventually results in severe hemoconcentration with reduction in circulating blood volume, eventually leading to peripheral vasoconstriction along with narrowing of pulse pressure. In severe dengue infection, the Systemic

vascular resistance is increased while the cardiac index is reduced as opposed to other systemic infections. Most infected patients have tender hepatomegaly, also ascites and pleural effusions are common in them. In those untreated cases, eventually severe hypotension may result, which can be fatal if intravenous fluids are not given.

The mainstay of therapy for severe Dengue shock is the rapid restoration of circulating plasma volume so as to maintain normal Hemodynamics. From the data available, there is a lack of clear consensus on the optimum choice of intravenous fluids in those admitting with severe dengue shock. Historically, the management guidelines by WHO, first proposed in 1975, recommended initial fluid replacement with crystalloid solutions, to be followed by colloid solutions for patients with refractory shock. As severe dengue shock is associated with the leakage of small plasma proteins, colloid preparations with bigger molecular weights like albumin may offer some theoretic advantage.[14] Colloidal solutions, being higher in molecular weight stay in the circulation longer and thus, increase the colloid oncotic pressure, eventually these solutions help to draw extravasated fluid back into circulation. Earlier studies have proposed that much larger volumes of crystalloids need to be infused as compared to colloid solutions in order to achieve the same degree of fluid resuscitation, and this may eventually lead to severe fluid overload or pulmonary edema in patients.

Till today, there are no specific medications for treatment of dengue infections. Our mainstay of severe dengue treatment is prompt and vigorous fluid resuscitation. If appropriate volume of fluid resuscitation is started at an early stage of infection, the shock due to vascular leak is usually reversible; even in very severe cases but in those patients in whom the fluid resuscitation is inadequate, these patients may subsequently progress to irreversible shock and death. In majority of severe dengue patients, the capillary leakage resolves by sixth day of disease and is followed rapidly by complete recovery. [15] In the initial

24-48-hour period following initial fluid resuscitation, there may be recurrent episodes of shock reflecting the severity of underlying capillary leakage.

Administration of crystalloids to dengue patients with severe shock is usually effective in restoring circulating blood volume, but large fluid volumes are often required. To avoid fluid overload, refractory cases thus, require the use of colloidal solutions. There have been no previous randomized studies to assess the optimal fluid replacement regimen for resuscitation in severe dengue shock. Administration of colloidal solutions is beneficial, as they contain bigger molecules that escape slowly from circulation than crystalloids, thus could theoretically overcome shock more quickly and effectively than crystalloids. Also colloids are beneficial in preventing the recurrence of severe shock and reduce the requirement for large volumes of intravenous fluids for resuscitation, eventually reducing the risk of fluid overload. [16] But, in clinical practice a clear benefit of colloids over crystalloids has not yet been demonstrated. Conversely, almost all colloid solutions (esp. synthetic) have adverse effects on homeostasis, an important observation especially in patients with dengue.

The WHO recommendations for dengue treatment were initially proposed in 1975, following the marked rise in morbidity and mortality associated with severe dengue shock in southeast Asia. It is surprising that, even though fluid volume replacement is very critical in management of severe dengue shock, there have been no large-scale studies carried out to determine optimum fluid regimen in them, and the current WHO guidelines have remained virtually unchanged.

Human albumin, is a serum protein synthesized by liver and derived from blood, is a natural colloidal solution. Theoretically qualities of albumin make it an ideal colloidal fluid for use in resuscitating hypotensive patients to maintain intravascular oncotic pressure. This can improve blood pressure for longer periods of time relative to amount of crystalloid fluid used, thus reducing the amount of fluid

extravasation to the interstitial space (third spacing).Albumin, specifically human serum albumin, is amonomeric protein with a molecular mass of 66.5 kDa and a serum half-life of around 21 days. It is synthesized by the liver and is most abundant protein type in blood. Albumin being colloid has several functions most notable of them being a determinant of plasma colloid oncotic pressure. Once albumin is synthesized it gets released into bloodstream at a rate of about 10-15g/day, where it functions to raise the colloid oncotic pressure and act as a transporter of both endogenous and exogenous ligands [17] in circulation. It also exhibits antioxidant properties. [18]

Iso-oncotic 5% albumin has a colloid oncotic pressure of 20mmHg, whereas 25% albumin has a colloid oncotic pressure of 70mmHg in circulation. Both formulations have a duration of effect of approximately 12hours post administration. 5% albumin has a volume expansion effect of 80-100% of the initial infused volume, whereas 25% albumin have a volume expansion effect of 200-400%. [19]

For decades, human serum albumin has been administered to patients in shock, to provide adequate colloid oncotic pressure and intravascular volume.

In 1998, a report from the Cochrane injuries Group Albumin Reviewers [20] indicated that administration of albumin may be potentially harmful in critically ill patients, as compared with administration of crystalloid solutions. Further meta-analyses reported contradictory statement.

Albumin being a primary determinant of colloid oncotic pressure in circulation, it acts as carrier for several endogenous and exogenous compounds, along with its antioxidant and anti-inflammatory properties. [21] It acts as a scavenger of reactive oxygen species and nitrogen species, and also operates as a buffer molecule for acid- base

equilibrium in our body. There is convincing evidence for suitable advantages of albumin administration during severe sepsis.

Another study using albumin for resuscitation in severe burn patients with shock, have shown decreased fluid overload and mortality among patients with severe burn shock, [22] a condition which shares similar pathophysiology of extensive vascular leakage and risk of compartment syndrome as seen in severe dengue. As evidenced by this study, Albumin infusion in severe dengue shock patients may also provide survival benefit because mortality in severe dengue can go up-to 45%-70% in view of fluid overload and malignant edema. But enough data is not available especially in pediatric population attributing improved outcome in severe dengue patients following Albumin infusion. Based on this view, a study was carried out to access the efficacy of albumin infusion on progression of severe Dengue shock and outcomes as compared to crystalloids.

AIM AND OBJECTIVE

PRIMARY OBJECTIVE: -Efficacy of 25% Albumin plus standard treatment compared to standard treatment in patients with severe dengue with respect to mortality.

SECONDARY OBJECTIVE: -Reduction in hct after 24 hours of treatment

- degree of volume overload
- duration of PICU stays
- duration of hospital stays
- Need for Non-invasive and invasive ventilation and duration if required
- need for inotropic support
- need for platelet transfusion
- need for packed cell transfusion
- need for diuretics

REVIEW OF LITERATURE

Dengue (break borne fever) being the most notorious vector-borne viral infection among humans, is under global renascence. More than 100-200 million people are infected every year and more than 2.5 billion population is at the likelihood of contracting dengue infection in tropical and subtropical climates worldwide. [23] Dengue infection causes broad spectrum clinical disease, which can range in severity from a subtle febrile illness to serious bleeding and, in most severe cases a refractory Dengue shock. Infants and children with dengue infection have high risk of precipitating severe illness as they have higher risk of developing shock.

Dengue hemorrhagic fever and severe dengue shock syndrome are seen as the leading causes of pediatric hospitalization in southeast-Asia, with up to 5 lac cases reported annually to World Health Organization. [24] Mortality rates from around <1% to 5% are usually seen for severe Dengue from centers experienced in fluid resuscitation [25] but mortality rates high up to 44% have also occasionally been reported with regard to established shock. [26, 27]

The two major pathophysiological mechanisms underlying the severe dengue infection are plasma capillary leakage leading to hypovolemic shock and/or abnormal hemostasis subsequently leading to hemorrhage. [28]

As the Clinical course of dengue infection includes febrile, critical and recovery phases and there are different challenges for fluid management at each of these stages of dengue infection. [29] In the initial febrile stage, the aim is to treat dehydration. Majority i.e. around two-third of non-shocked dengue patients can be treated as outpatients with oral rehydration regimens; while remaining one third of these

patients and all severe dengue shock patients require aggressive intravenous fluid therapy. [30]

During the critical phase, there is an increase in plasma capillary permeability, eventually shock may result if a large volume of plasma is lost to interstitium through leakage. Recommended regimen for treatment of severe dengue shock as per WHO guidelines is: immediate and rapid replacement of lost plasma fluid with isotonic crystalloid fluids or, in case of profound refractory shock, colloidal solutions are preferred. The total amount of Intravenous fluid for initial resuscitation and replacement during this critical phase of 24-48 hours is limited to maintenance + 5% deficits since the plasma selectively leak into pleural and abdominal spaces. If more fluid is given during resuscitation, these patients may subsequently have respiratory distress/failure resulting due to massive pleural effusion and ascites. [31]

Crystalloids followed by colloidal solutions as primary volume expanders is the usually followed resuscitation regimen to replace intravascular volume in the management of dengue shock patients. Crystalloid solutions are aqueous solutions of mineral salts or other water-soluble molecules, while colloids contain larger insoluble molecules such as gelatin, dextran's or starches.

In practice, most commonly used crystalloid solution is Normal saline, a hypertonic solution with an osmolality of up to 308mOsm/L, it has higher sodium and chloride content than normal plasma. Normal saline is a suitable option for initial fluid volume resuscitation but repeated large volumes of normal saline boluses may subsequently lead to hyperchloremic acidosis and decreased blood pH due to excessive chloride levels. Therefore, if serum chloride begins to rise above the normal range, than other alternatives like Ringer's lactate may be considered.

Ringer's lactate has comparatively lower sodium and chloride levels than normal saline, and also osmolality is 273mOsm/L than normal

saline. Ringer's lactate should be better avoided in liver failure due to their decreased ability to metabolize lactate.

Among patients with hypervolemia, a comparatively lower -volume resuscitation strategies using the physiological properties of colloidal solutions have been developed more recently. As a known fact, colloidal solutions have longer intravascular retention times as compared to crystalloid solutions. Where lesser volume if given during resuscitation might fails to restore intravascular volume while excessive fluid administered during aggressive resuscitation may cause fluid overload contributing to morbidity thus, consider all intravenous fluids as similar to drugs. [32]

Most common types of colloidal solutions used for plasma volume expansion are gelatin, dextran and starch-based solutions.

In comparison with crystalloid solutions, colloids can expand volume in excess of the actual volume of fluid administered and thus is beneficial for rapid fluid delivery for emergency resuscitation of profound hypovolemic shock.

Along with lesser requirement, colloidal molecules show higher efficacy because they also increase plasma oncotic pressure, thereby altering the leakage of fluid along the capillary membrane thus help to draw the leaked fluid back into the capillary from the interstitial space. It has been estimated that around more than twice higher number of crystalloid solutions need to be administered intravenously for similar hemodynamic balance as achieved with lesser volume of colloids. [33]

The primary aim of resuscitation fluid administered is to remain in the intravascular compartment and exert the colloid osmotic pressure to replenish the ongoing shock state; these properties of a fluid are mainly dependent on the molecular weight of intravenous fluid administered along with size of fenestrae in capillaries around the endothelial cells.

Physiologically, synthetic colloids known are polydisperse, with a range of molecules of different molecular weights being present in single solution. Among them, the larger molecules will remain within the circulation for longer period while smaller molecules, exert a greater osmotic effect. So, dextran 70 are glucose polymers with an average molecular weight of around 125,000, it increases plasma volume by up to 1.5 times of the actual volume infused, with a remarkable volume expansion that persists for duration of 6 hours. [34, 35] On the other hand, gelatin solutions have an average molecular weight of 35000 with a comparatively narrow range, giving a volume effect of 110%, which lasts for around 2hours.

The plasma volume expanding capacity of the crystalloids is related to the sodium concentration of fluid, which is 154mM for normal saline and 131 mM for Ringer lactate solution. In contrast to colloids, they have no added volume effect and are likely to be lost from circulation very promptly. [36]

A number of randomized controlled trials have been undertaken to compare efficacy of different fluid regimens in managing severe dengue shock in children.

Another double – blinded, randomized study designed to compare efficacy of different resuscitation fluid (6% dextran 70, 3% gelatin, Ringer's lactate, or 0.9%saline) among 50 pediatric patients with dengue presenting in severe shock at admission. [37] This study further contributes to the evidence that these fluids vary considerably in their efficiency to replenish hypovolemic states based on their individual properties. Monitoring during two- hour period following initial resuscitation, showed that there was considerably greater recovery in cardiac index, hematocrit, and blood pressure at the end of the infusion of the study fluid among children who had received a colloidal solution than among those who had received a crystalloid solution. Trial also supports the literature that prompt and judicious use of colloidal

solutions in patients with per found dengue shock may eventually decrease the final volume of fluid need to be administered to support intravascular volume and maintain tissue perfusion. Based on individual comparisons among colloids, dextran 70 came out to be the most efficient colloidal solution for improving cardiac index and hematocrit.

This was followed by another one-year study of 230 children with dengue shock syndrome who received treatment with similar fluids. [38]

This study focused on sustained as well as immediate treatment effects of initial fluid resuscitation. This randomized study showed no clear benefits among the fluids in terms of the time to recover from the initial episode of shock and the time to achieve final cardiovascular stability. Study observed that the crystalloid group required, on average, twice the volume of dextran after the initial fluid resuscitation as compared to the colloid group. Post hoc analysis of this one-year study further suggested that early treatment with colloidal solutions prompted recovery in sick children having a low pulse pressure of even 10mm Hg or less at admission (meaning the group with comparatively greater cardiovascular compromise).This study also showed that majority of patients with dengue shock had mild to moderate shock at presentation and they will respond well to crystalloids. Only a small minority with serious illness may require aggressive and prompt resuscitation with colloids.

Another large randomized study of 383 children included two groups, where patients were divided as per presenting pulse pressure. [39]

Those Children with moderately severe shock having pulse pressure of greater than 10 but less than 20mmHg were simply allocated arbitrarily to transfuse either Ringer’s lactate, 6% dextran (a colloid)or 6% Hydroxyethyl starch (a colloid).Study showed that giving ringer’s lactate was as effective as colloid therapy. Requirement for rescue colloid

following initial resuscitation was similar for both crystalloid and colloid fluids in the two severity groups. However, it was observed that treatment with ringer lactate resulted in less rapid improvement in the hematocrit and a comparatively longer time to initial recovery than did treatment with either of the colloid solutions. This difference was significant between crystalloids and colloids with p value of 0.02.

Another trial of 129 children with severe shock labelled as those having a very low pulse pressure (less than10mmHg), were arbitrarily transfused with any one among colloid solutions, either dextran 70 (n=67) or Hydroxyethyl starch (n=62). The trial suggested that both colloid solutions performed equally well with regard to cardiovascular stability and the number of patients who required rescue colloid for resuscitation. But it was noticed that the dextran preparation was associated with more adverse events than Hydroxyethyl starch. Incidence reported was 8.0% vs 0.5%, respectively. Various reported adverse events during transfusion included transient high fever and rigors among others. [40]

The allergic reactions noted, responded well to symptomatic treatment alone with no further care. Also, there were no significant differences in severe adverse events noticed, like as significant new bleeding or clinical fluid overload, among others.

Another study conducted among 104 Dengue hemorrhagic fever patients having severe plasma leakage who had failed to respond to initial crystalloid boluses and eventually required fluid resuscitation compared bolus doses of two colloids, 10% dextran 40 (n=57) and 10% HAES-steril (n=47). These patients were subsequently monitored for role of colloid solutions including their effectiveness; impact on renal function and hemostasis or any complications. [41]

Study showed that HAES- steril was as effective as dextran 40, when compared on the measures of hematocrit change and in terms of the

both number of bolus and volume of fluid required. Both colloidal solutions were safe with no adverse event noticed or any interference with renal function or hemostatic function.

In critical period of dengue, capillary wall permeability increases with trans-endothelial escape of serum albumin through pores, and as albumin is the major plasma oncotic constituent, so it results in the development of hypoalbuminemia along with edema formation. Supplementing plasma volume with administered fluid while resuscitation aims to improve tissue perfusion in a sustained manner; however, significant fluid shifts among the physiological compartments may happen, particularly with repeated intravenous fluid administration. [42] Intravenous albumin administration is the only colloid solution that treats intravascular fluid volume deficits by both the fluid bolus effect and by raising the plasma oncotic pressure with the serum albumin.

Until recently various trials on colloidal solutions (albumin, gelatin, Hydroxyethyl-starch and dextrose) have observed that as compared to natural colloids like albumin, the semi synthetic artificial colloids like gelatin are used many times more frequently, also showed that as compared to crystalloids, colloids were administered during more episodes and to a higher number of patients. [43] There are clear evidences showing the long standing and well-established safety concerns regarding the use of colloids for intravenous resuscitation, thus the patterns of resuscitation are markedly different among different countries. [44] Previous trial conducted with HES as resuscitation fluid has confirmed multiple adverse events associated with the use of Hydroxyethyl starch solutions, these artificial colloidal solutions has been issued warnings and thus are been approved for use in intensive care units in recent past years. Based on this background, and in the light of the lack of proof of efficacy for hard clinical endpoints for its indications, in 2022, the European Medicines Agency decided to withdraw marketing authorization for Hydroxyethyl starch colloidal

solutions. Hydroxyethyl starch colloid solutions will no longer be available in the European Union, after a short transition phase. [45]

As with HES, Dextran colloid solutions are now no longer preferred for fluid management in view of their numerous adverse effects. [46]

As safety concerns associated with the use of Hydroxyethyl starch are well established, safety of gelatin, another colloid which is otherwise poorly studied is being investigated. [47] A randomized controlled trial was initiated to study the use of gelatin in septic shock,[48] but the trial was soon terminated by the Data Safety and Monitoring Board,[49] due to the potential adverse effects of gelatin (kidney injury, bleeding, and allergy).

Along with better safety profile, presence of several secondary functions, substantially increase the use of human albumin solutions over other fluids, among colloids. Albumin being a natural colloid it is associated with lesser side effects like pruritus, anaphylactoid reactions and coagulation abnormalities when compared to synthetic colloids. 5% Albumin solution is iso-oncotic to plasma and leads to 80% increase in fluid volume while 25% Albumin solution is hyper-oncotic and leads to 200-400% volume expansion within 30 minutes of administration. [50] The effect of colloids last for around 16-24hours. Multiple clinical trials have been conducted among adults and pediatric population to demonstrate both safety and efficacy of albumin infusion over other types of fluid resuscitation.

After years of its clinical use as plasma expanders and high cost resulting in unaffordability in many hospitals and countries, efforts are made by hospital pharmacies to better regulate the use of albumin. [51]

In 1998, in a meta-analysis, albumin solutions were reviewed by one of the Cochrane Injuries Group Albumin Reviewers as an intervention potentially leading to higher mortality in patients with hypovolemia,

burns, or hypoalbuminemia. [52] The meta-analysis received extensive criticism in view of methodological deficiencies [53] but eventually led to extensive usage of artificial colloids as a cheaper alternative, instead of albumin, so called newer generation colloid solutions especially Hydroxyethyl-starch and gelatin were adopted, preferring lower molecular weights and substitutions. [54]

Eventually a large, double-blind Randomized controlled trial carried out in critically ill patients, the 'Saline versus Albumin Fluid Evaluation' (SAFE) study, [55] invalidate the safety concerns associated with albumin administration from the Cochrane analysis.

The SAFE Study [56] showed that the fluid resuscitation volume in the normal saline group was 1.4 times higher as compared to the albumin group, suggesting that albumin infusion has better efficacy for the maintenance of blood volume. Study showed that safety of human serum albumin solution is similar to that of normal saline for fluid resuscitation rather albumin use in view of its secondary effects may improve prognosis of patients with severe sepsis.

The SAFE study was conducted because, despite numerous clinical trials, it remained a query whether the type of intravenous fluid administered to replenish the tissue perfusion among hemodynamic unstable ICU patients affects survival or not. In a double-blind RCT, hemodynamically unstable patients with variable underlying etiology, received either normal saline or 4% human albumin solution for fluid resuscitation for up to 28 days of their stay in the ICU. All-cause mortality by day 28 was the primary outcome studied. With 6997 patients enrolled in study, the study was large and informative as it was conducted at a lower risk of bias. Both the primary outcomes and all secondary outcomes common in ICU studies were comparable among both treatment groups. Study mainly concludes that both the intravenous fluids eventually result in similar outcomes as per the indications studied.

When safety of 4% albumin was compared to normal saline in SAFE, it was observed that, over all, there was no difference between the two fluid treatment groups. In a subgroup of patients with traumatic brain injury (TBI), the treatment with 4% albumin resulted in worse outcome than that seen with saline, [57] but this was not related to albumin as a molecule but to the comparative hypotonicity of the solution used versus normal saline. [58]

Regarding fluid balance. It was concluded that patients randomized to the albumin group in SAFE study, received significantly lower intravenous fluid volumes as compared to the saline group. Significantly higher fluid balance was noticed in saline group as compared to albumin group during initial ICU days. The following proportion of the volume of albumin to the volume of saline administered were observed during the initial four days: 1:1.3 on day 1, 1:1.6 on day 2, 1:1.3 on day 3, and 1:1.2 on day 4. The measured central venous pressure was significantly higher in the albumin treatment group compared to saline group at all points of time during the initial four ICU days. [55]

Eventually, a post hoc analysis of this study carried out to determine whether the final outcomes were influenced by baseline serum albumin concentration. [57] Data regarding, baseline serum albumin concentration were available for 86.3% patients; around 40.6% patients had a baseline serum albumin concentration of $\leq$25 g/L , and other 59.4% patients had a baseline serum albumin concentration of $\geq$25 g/L. Study observed that patients with lower baseline albumin concentration were older, more chances to be admitted to the ICU after surgery, at higher risk of having severe sepsis or acute respiratory distress syndrome, but less likely to have had TBI. Even after adjusting other baseline risk factors for death, it was noticed that baseline serum albumin concentration of 25 g/L or less was independent risk facto associated with death. However, final outcomes of resuscitation with albumin and saline were comparative among both the groups,

irrespective of the patient's baseline serum albumin concentration. The results of this post hoc analysis confirmed that intravenous administration of albumin is safe not only in ICU patients with variable underlying etiology but also in ICU patients with baseline hypoalbuminemia. Apart from survival, other secondary outcomes were similar among the two treatment groups with baseline serum albumin concentration of ≤25 g/L, including duration of stay in the ICU, duration of hospital stay, duration of mechanical ventilation, and duration of renal replacement therapy.

Overall, in SAFE study, during the initial four days of admission approximately 1:1.4 ratio was observed of the volume of albumin to the volume of saline administered to patients in ICU. When comparing the volumes of study fluid administered for hemodynamic stabilization in this double-blind trial, a significant difference was observed between 4% albumin and normal saline in the initial ICU days.

Based on the background of feasible potential biomechanisms in sepsis [59] and the possible favorable effect of Intravenous albumin replacement in the SAFE trial on a predefined subgroup of some patients with severe infection, [60] the 'Albumin Replacement in Patients with Severe Sepsis or Septic Shock' (ALBIOS) study was done. Aim of the study was to explore whether a systematic correction of reduced serum albumin levels with the administration of 20% albumin influence the survival of patients belonging to this specific group of septic shock. [61] Baseline serum albumin concentrations were recorded in the albumin group(24.1 ± 6.3 g/L) and crystalloid groups (24.2 ± 6.2 g/L). Study revealed that the correction of decreased serum albumin levels had no effect on the outcome of patients with severe sepsis or septic shock. Only a post hoc analysis of this study suggested that the survival of some non-stratified subgroup of patients admitted with septic shock may be successfully improved. Prospectively, results of this hypothesis were studied in another randomized controlled trial. [62]

In ALBIOS trial, during the initial seven days, the median cumulative positive fluid balance was significantly higher in the crystalloid group (1220ml) as compared to albumin group (347 mL).Also the need for duration of vasopressor or inotropic agents was comparatively longer in crystalloid group than albumin group. [63]

In an ICU study conducted by Dubois et al. [64] patients with serum albumin concentration ≤31g/L were included. Patients were randomly allocated into control group and albumin group. Those in albumin group were administered 300 mL of intravenous 20% albumin on day 1 of admission and 200 mL on subsequent days. While patients in control group received no albumin. Baseline serum albumin levels in the albumin (23.7± 3.7) and control groups (23.2 ± 4.4 g/L) were observed. Study showed that serum albumin concentration did not change in the control group while rapidly increased in the albumin group when measured daily from day 1 to 7. The mean positive fluid balance was almost three times greater in the control group (1679ml) as compared to the albumin group (658ml), however the need of diuretics was identical in both groups.

Another meta-analysis emphasizing on fluid resuscitation of patients with sepsis or septic shock, revealed that as compared to crystalloids, use of colloid Hydroxyethyl-starch resulted in greater risk of mortality (10 RCTs; OR1.13) and need for Renal Replacement Therapy (7 RCTs; OR1.39). On the other hand, when albumin administration compared to Hydroxyethyl-starch, use of albumin resulted in reduced risk of death (OR 0.73) and also decreased need for kidney replacement therapy (OR 0.74). [65]

In accordance with literature, Suchitra Ranjit [66] et al conducted a prospective observational study, to determine the effect of some proactively applied targeted interventions on mortality, positive fluid balance, ventilator requirements, PICU days and mortality as compared to matched retrospective cohort with severe dengue. ST+

group received standard therapy along with ICU targeted interventions that have been proven useful before where underlying pathology was almost same resulting in third space loss of plasma due to increased vascular. The interventions include advance albumin infusion for crystalloid nonresponsive shock, aggressive monitoring for clinical symptoms of abdominal compartment syndrome, introduction of potential intubation management protocol along with other interventions. Primary and secondary Endpoints were compared in a matched retrospective cohort who were managed as per WHO standard treatment guidelines only. Study showed introduction of these therapies in a comparatively sicker group of patients resulted in in better outcomes (ST+ group).Study demonstrates that these modalities help to achieve negative gross balance at end of initial 3 days and decreased incidence of clinically significant intra-abdominal hypertension, that may need therapeutic tap. Study showed that almost 7.7% patients in ST+ group and 30% children in ST group with P value of 0.025. Other benefits in ST+ group were significantly decreased need of invasive and non-invasive ventilation modalities, about 18.4% patients in ST+ and 53.3%cases in ST group need ventilation modalities with p value of 0.003, reduced incidence of significant bleeding and AKI, along with comparatively lower need for stay in ICU stay and decreased death incidencei.e2.6% in ST+ group while 26% in ST group with P value of0.004. Hence, Study concludes that employment of these targeted ICU based modalities along with standard treatment as per WHO contribute to better outcome.

Some studies have revealed that in patients receiving kidney replacement therapy, intravenous administration of 20–25% human albumin solution lower the incidence of intradialytic hypotension and tolerates fluid removal better as compared to saline if serum albumin concentration is similarly lowered. [67]

Another study equating the effects of albumin and crystalloid administration on outcome in adult patients with severe septic shock by

Jng-Yuan Xu et al. [68] An absolute record of 5,534 patients was identified through the initial search. Five studies compared the effect of crystalloid with albumin solutions. A total of 3,658 patients had severe sepsis while 2,180enrolled cases had septic shock in the meta-analysis. In terms of heterogeneity the difference was non-significant ($P = 0.86$). As compared to crystalloid solutions, 90-day mortality was lower though not significant with albumin solution as observed in severe sepsis ($P = 0.08$). Instead, the use of albumin for fluid resuscitation resulted in significantly improved 90-day survival among treated patients than crystalloids ($P = 0.03$). As compared to normal saline, the treatment with albumin solution for resuscitation resulted in slightly better outcome among severe sepsis patients ($P = 0.09$).

A study by Ramakrishna myathari, [69] an observational study conducted without control group, here 26 patients who had lower serum albumin concentration (<3g/L) were administered 20% albumin solution under supervised diuretic cover, at the time of onset of critical period. The study showed that early recovery, decreased duration of hospital stays, lower morbidity and mortality rate with overall greater financial benefit. This study also concludes that reduced serum albumin concentration had been found as an early marker of capillary leakage, the loss of albumin because of increased plasma permeability leads to a lower capillary osmotic pressure eventually leading to third spacing. Therefore, early spotting of the onset of critical period and timely administration of albumin solution under the diuretic cover, shows to provide protection against morbidity/mortality and also decrease the duration of ICU stay.

Another prospective and quasi-purposive trial conducted in the department of pediatrics at Bangladesh specialized Hospital, Bangladesh. [70] This study was carried out to observe status of albumin, status of platelets, the contribution of albumin administration on treatment endpoints and further the progression of the enrolled patients on the basis of the endpoints. Here, albumin solution was

administered to all enrolled cases of Dengue fever that were at higher risk to evolve into severe form as pointed out by serum albumin levels beginning to decline. Study observed that none of the case enrolled and received albumin, thus developed shock or dengue hemorrhagic fever post admission. Also, as monitored hemodynamically, the shock did not last for even more than initial 24 hours of hospital admission. So, this study concludes that dengue shock thus can be prevented by judicious infusion of albumin in dengue fever among hospital admitted pediatric population.

Another randomized trial conducted by Simon Finfer et al [71] compared albumin and normal saline for volume resuscitation among ICU patients. Study demonstrates lower trend of mortality in albumin fluid group, but the difference was not significant among the groups in terms of mean duration of days spent in ICU, days of hospital stays, duration of mechanical ventilation or, duration of renal replacement therapy.

Demonstrating the role of albumin solution as a resuscitation fluid for sepsis patients, another study by Delaney et al [72] reported that use of albumin solutions for resuscitation of those with underlying sepsis had lesser number of deaths compared to other intravenous fluid resuscitation regimens.

Further Vincet et al [73] studied the morbidity among a group of hospitalized patients receiving albumin containing solutions. Study was a randomized controlled trial which showed that albumin administration lowers morbidity in acutely ill hospitalized patients.

Another Randomized controlled trial equated the role of timely management with 5% albumin solution among adult patients with Dengue hemorrhagic fever when compared to Ringer's lactate. [74] Early resuscitation with 5% albumin solution showed better control on vascular integrity and improved function when compared to ringer

lactate in adult hospitalized patients with grade I&II Dengue hemorrhagic fever, thus terminate the progression of dengue hemorrhagic fever into severe dengue shock syndrome with related complications eventually leading to prompt recovery and shorter length of hospital stay.

Another quasi-purposive prospective study conducted by M Tawfique et al; among all pediatric patients admitted with Dengue fever or severe dengue shock during the period from June 2022 to December 2022.Total 44 children in shock were managed as per study protocols, to investigate the effect of albumin on treatment outcome and preventing severe dengue shock among pediatric patients with Dengue fever. Study found that albumin is safe to use in pediatric patients with Dengue fever to prevent Dengue shock syndrome. It also effectively lowers morbidity among dengue affected children.

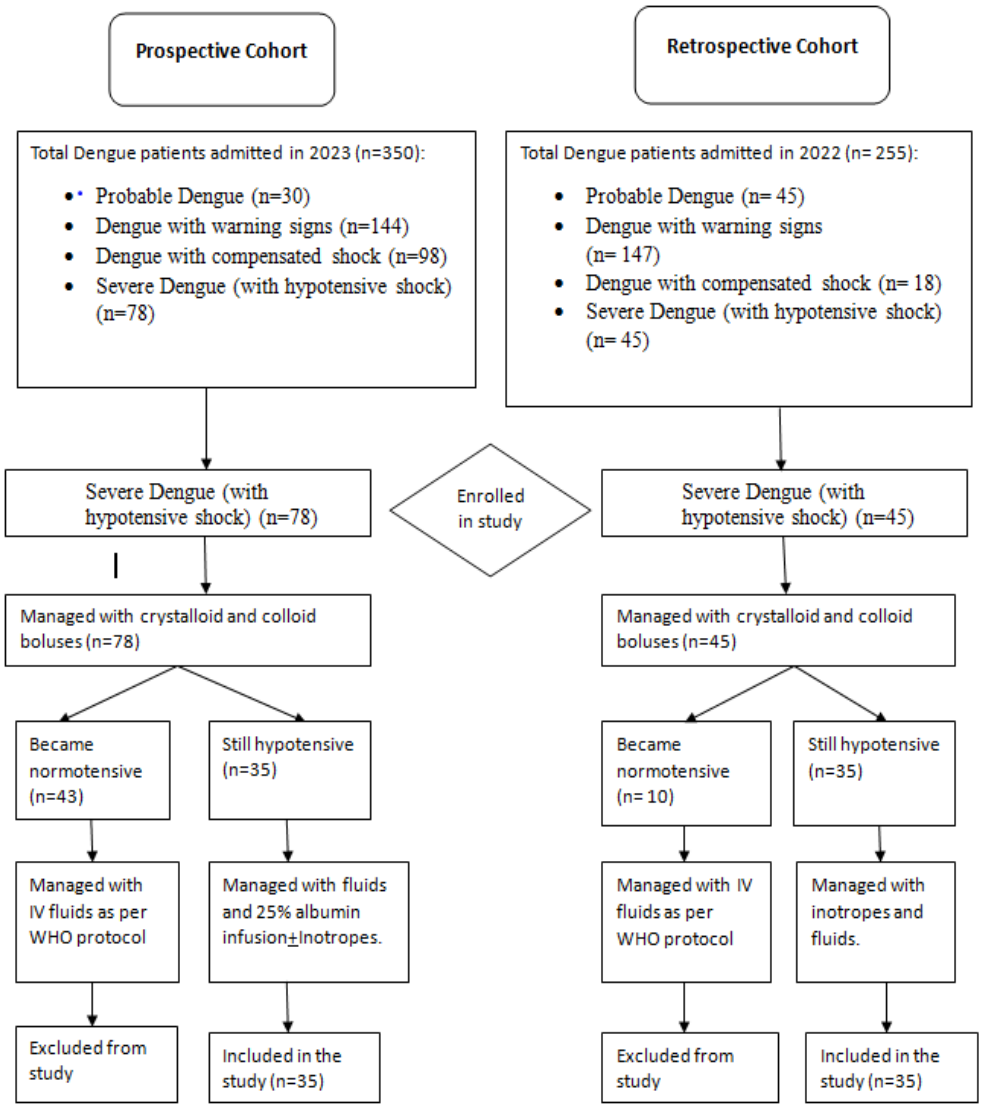
A prospective-observational study was carried out among children with severe dengue shock admitted to pediatric critical units, to equate the endpoints of initial fluid resuscitation with 20% albumin (Group A) versus 5% Albumin (Group B) in severe dengue. [75] A total of 76 children were recruited for study, of which 34 patients were allocated in Group A and 42 patients were allocated in Group B. Study revealed that children resuscitated with 20% albumin solution had better lactate clearance, reduced duration of mechanical ventilation, duration of PICU stay and hospital stay. Study thus showed that 20% albumin solutions are superior to 5% albumin solutions for resuscitation in severe dengue cases.

All these meaningful clinical trials conducted on volume resuscitation thus, showed that administration of albumin solutions results in lower cumulative fluid balance than crystalloid solutions. Further prospective studies revealed that smaller infusion volumes are sufficient for hemodynamic stabilization when albumin solutions are used for resuscitation instead of crystalloid solutions. The finally achieved

plasma volume expansion is greater with 20–25% albumin solutions than with 4–5% albumin solutions. In SAFE study, the total administered study fluid volume ratio of normal saline to 4% albumin was significantly greater among patients with a baseline serum albumin concentration of ≤25 g/L as compared to those having serum levels of≥ 25 g/L, this observation suggested that the lower the serum albumin concentration, the higher the volume effects of Intravenous albumin solutions. Thus, clinical study data suggest that lower serum albumin concentration acts as an effect moderator in fluid resuscitation and plasma volume expansion with Intravenous human albumin solutions.

MATERIAL AND METHODS

Figure 01:- Flow Chart of Study


Prospective Cohort
Retrospective Cohort
Total Dengue patients admitted in 2023 (n=350):
Probable Dengue (n=30)
Dengue with warning signs (n=144)
Dengue with compensated shock (n=98)
Severe Dengue (with hypotensive shock) (n=78)
Total Dengue patients admitted in 2022 (n= 255):
Probable Dengue (n= 45)
Dengue with warning signs (n= 147)
Dengue with compensated shock (n= 18)
Severe Dengue (with hypotensive shock) (n= 45)
Severe Dengue (with hypotensive shock) (n=78)
Enrolled in study
Severe Dengue (with hypotensive shock) (n=45)
Managed with crystalloid and colloid boluses (n=78)
Managed with crystalloid and colloid boluses (n=45)
Became normotensive (n=43)
Still hypotensive (n=35)
Became normotensive (n= 10)
Still hypotensive (n=35)
Managed with IV fluids as per WHO protocol
Managed with fluids and 25% albumin infusion±Inotropes.
Managed with IV fluids as per WHO protocol
Managed with inotropes and fluids.
Excluded from study
Included in the study (n=35)
Excluded from study
Included in the study (n=35)

SOURCE OF DATA

Type of Study: - Ambispective interventional study

Settings - Department of Paediatrics, Dayanand Medical College and Hospital, Ludhiana, Punjab.

Duration - January 2021 to December 2023.

Participants: -Patients aged 1 month to 18 years with severe dengue with hypotension not responding to ≥ 40ml/kg of crystalloid/colloid bolus over 1-2 hours were included in study.

Diagnosis of severe Dengue was done according to WHO guidelines after NS1 Antigen/ serological (Dengue IgM ab) confirmation. Only laboratory confirmed cases were included in study.

Dengue antibody test for IgM detection was done using an IgM antibody-capture enzyme-linked immunosorbent assay (MAC-ELISA) (PanBio, Standard Diagnostics Inc, Gyeonggi-do, Republic of Korea 2020). Dengue NS1 antigen was detected with the ELISA technique (J Mitra& Co Pvt Ltd, New Delhi 2020).

Written informed consent taken from parents/legally accepted representatives of children. Written assent was obtained from children between 12-18 years of age.

The Study protocol was approved by Institutional Ethics Committee.

METHOD OF COLLECTION OF DATA

Inclusion Criteria

- Patients between 2 months to 18 years of age.
- Patients diagnosed with Severe Dengue with Hypotensive shock.

Exclusion Criteria: -

- Patients > 18 years of age
- Dengue with only warning signs
- Probable Dengue cases.
- Severe Dengue with Co-infection (Enteric fever, scrub typhus, Leptospira etc.)

SAMPLE SIZE CALCULATION: -

By using previous study (Suchitra ranjit et al), the mortality rate is 26% in Standard treatment and 2.6% in 25% albumin with standard treatment (standard treatment plus)

Based on this assumption

The formula used in the situation is as under:

$n = [Z\ 1- \alpha/2\ \sqrt{2}\ P\ (1-P) + Z\ 1- \beta.\sqrt{\{P1(1-P1) + P2\ (1-P2)\}}]2$

$(P1-P2)\ 2$

Where $P = (P1+P2)/2$

• Approximate value of efficacy/cure rate for standard treatment =P1

• Approximate value of efficacy/cure rate for standard plus treatment = P2

• Effect size = (P2-P1)

Level of significance (usually 5%)

• $Z\alpha$ = Value of standard normal variate corresponding to α level of significance (1.96)

$Z\beta$ = The standard normal deviate for desired power (0.842)

With the above assumptions the sample size for 95% confidence level & 80% power works out 32 in each group.

We planned to enroll 35 patients in each group.

Total 70 patients of severe dengue were enrolled in study, after screening for eligibility criteria. All patients received Standard treatment as per WHO guidelines for treatment of severe Dengue. Those admitted from August 2022 to December 2023 also received 25% Albumin infusion in addition to Standard treatment if shock persisted even after 40ml/kg of crystalloid/colloid bolus.

Thus, patients divided into two groups:

- **ST PLUS ALBUMIN group-**
- Prospective Cohort
- August 2022 – December 2023.

- Total 35 patients were enrolled, who received Albumin infusion (0.5-1g/kg) over 6 hours, along with standard treatment as per WHO guidelines.

➢ **ST ONLY group-**

- Retrospective cohort
- January 2021- July 2022.
- Total 35 patients were enrolled, who received only standard treatment as per WHO guidelines.

CASE DEFINITION: -

1) **Severe Dengue Criteria (WHO 2009)**
   - **Severe plasma leakage:**
   - Shock
   - Fluid accumulation with respiratory distress.
   - **Severe bleeding**
   - As evaluated by clinician.
   - **Severe Organ Involvement**
   - Liver ALT or AST >1000
   - CNS – Impaired consciousness
   - Heart and other organs.
   -
2) **Major Bleeding: -**GRADE II/III/IV as per WHO Bleeding classification.

3) **PRISM Score –**Pediatric Risk of Mortality (PRISM) score III include 17 variables, used for prediction of mortality in critically ill patients.
   On admission, a standard PRISM III-24 questionnaire was used for study patients meeting the exclusion criteria.
   Higher the score, sicker is the patient. PRISM III has good predictive value and correlates well with the outcome.

4) **Fluid overload**: -was measured in term of Positive fluid balance (PFB) and Cumulative PFB.

   -Daily PFB calculation = [Total fluid intake (L)-Total fluid output (L)]/admission body weight (kg) x 100(%).

   - Cumulative FB = PFB for first 72 hours.

5) Indications for Platelet transfusion [76]: -

- Active significant bleeds
- >50,000mm^3 for invasive procedures.
- <20,000mm^3in the acute phase.

6) Indications for PRBC transfusion [76]: -

- Significant hemorrhage –anticipated loss 10% or more.
- Compromised perfusion in spite of appropriate fluid resuscitation and falling hematocrit.

7) Vasoactive Inotropic Score Calculation [77]-

Inotropic score = Dopamine dose (ug/kg/min) + Dobutamine dose (ug/kg/min) + 100 X Epinephrine dose (ug/kg/min)

Vasoactive-Inotropic score(VIS)=IS+10 x PDE Inhibitor (milrinone or olprinone)dose (ug/kg/min) +100 X norepinephrine dose (ug/kg/min) +10000 X vasopressin dose (U/kg/min)

8) **Grading of Pleural effusion**: - according to chest X-ray.

- Mild Pleural effusion – amount of pleural fluid did not exceed the 4^{th} rib.
- Moderate Pleural effusion- pleural fluid located in 2^{nd}- 4^{th}rib.
- Severe Pleural effusion- amount of pleural fluid exceeded the 2^{nd} rib.

Collection of Data: -

Data of retrospective cohort was collected from hospital records. On admission of patient, the history and clinical examination findings were recorded on a standard form and venous blood was taken to determine the hematocrit and full blood cell count and for serological and biochemistry tests.

All patients with severe dengue fever with hypotensive shock were managed vigorously in pediatric emergency. Intravenous fluid resuscitation was initiated with crystalloid solution (colloid solution if crystalloid bolus already received at referring hospital) at 20 ml/kg as a bolus given over 15−30 minutes to bring the patient out of shock as quickly as possible. After the initial bolus, patient was reassessed. If the condition was still unstable and there was no evidence of bleeding, intravenous fluids were changed to colloid solutions at 10-20ml/kg as a second bolus over 30 minutes to 1 hour. Cross-match fresh whole blood or fresh packed red cells and transfuse if there was evidence of severe overt bleeding.

If the condition is still unstable, we continued colloid solutions at 10 ml/kg as a third bolus over 1 hour. If patient was stable, colloid infusion rate was reduced to 7−10 ml/kg/hour for 1−2 hours, then changed back to crystalloid solution and reduced the rate of infusion as per WHO protocol.

Patients who remained in shock despite 40 ml/kg crystalloid over 3 h were labeled crystalloid refractory shock. The colloid solution used in the study was 4% gelatin (gelofusine) (not exceeding > 30 ml/kg/day).
Patients whose cardiovascular status did not improve after initial administration of the fluid resuscitation (crystalloid and colloid) were included in the study.

In the ST group (retrospective cohort), inotropic support was added in addition to fluid resuscitation to maintain circulatory perfusion and shifted to PICU for further management as per protocol.

In the ST+ Albumin group (prospective cohort), “Albumin Rescue”(25% Albumin) was administered at a dose of 0.5- 1 g/kg as an infusion over 6 h in addition to crystalloids (and inotropic support if needed). If the condition stabilize, patient was shifted to HDU for further management, otherwise shifted to PICU.

Pulse, blood pressure, and peripheral perfusion were monitored at least hourly in PICU until they were stable for a minimum of 24 hours, and then every 2-4 hours in HDU until discharge. Daily examinations for clinical fluid accumulation, hepatomegaly, hematocrit and platelet count were done in all patients.

Rescue colloid (usually gelofusine at 10ml/kg over one hour) was given later in the course of hospital stay, at the discretion of the clinician, if after initial stabilization patient again had narrow pulse pressure or peripheral vasoconstriction. Same group of consultants were responsible for patient management throughout the study.

Patients received inotropes, blood transfusions, diuretics, and other therapy at the discretion of the treating clinician. Noninvasive positive pressure ventilation (NIPPV) was the initial choice among patients requiring respiratory support or persistent shock. Intubation and PPV were initiated for patients who failed NIPPV and or who presented in respiratory failure. Fluid removal using diuretics was instituted in patients who developed features of fluid overload after shock/plasma leak was under control. In case of worsening in the form of hemodynamic instability with features of fluid overload, therapeutic drainage (Pleural tap/Abdominal drain) was planned based on discretion of treating physician.

Among those who develop AKI with refractory acidosis, electrolyte imbalance and features of fluid overload, Renal replacement was planned after pediatric nephrology consultation.

STATISTICAL ANALYSIS: -

- Data will be described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate.
- To determine whether the data is normally distributed, a Kolmogorov-Smirnov test will be used. Comparison of quantitative variables between the study groups will be done using Student t-test and Mann Whitney U test for independent samples for parametric and non-parametric data respectively.
- For comparing categorical data, Chi square ($\chi 2$) test will be performed and fisher exact test will be used when the expected frequency is less than 5.
- A probability value (p value)less than 0.05 will be considered statistically significant.
- All statistical calculations will be done using (Statistical Package for the Social Science) SPSS 21version (SPSS Inc., Chicago, IL, USA) statistical program for Microsoft Windows.

OBSERVATION AND RESULTS

Age Group

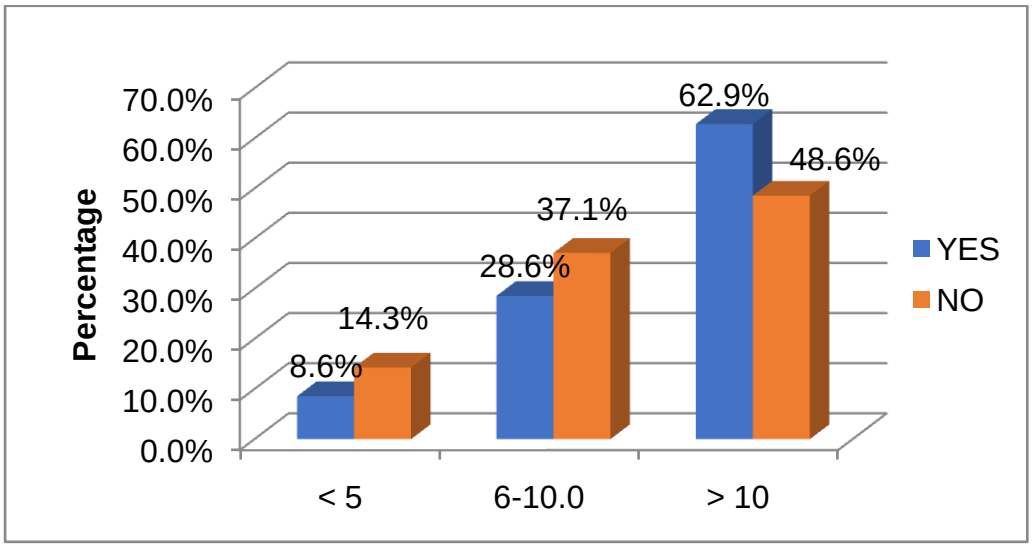
Total 35 cases were enrolled in each group.

Difference was non-significant with regard to age distribution in-between two groups with p value of 0.465. In Standard treatment plus Albumin group, 3 patients (8.6%) were below 5years, 22 patients (62.9%) were above 10 years, while in Standard treatment only group, 5 patients (14.3%) were below 5 years of age and 17 patients (48.6%) were above 10 years age. Remaining lies in age group of 6-10 years.

Table 01:- Age Group Distribution

		ST PLUS ALBUMIN		ST ONLY		p-value
		No. of cases	%age	No. of cases	%age	
AGE GROUP	< 5	3	8.6%	5	14.3%	0.465
	6-10.0	10	28.6%	13	37.1%	
	> 10	22	62.9%	17	48.6%	
Total		35	100.0%	35	100.0%	

Figure 02:- Age Group Distribution



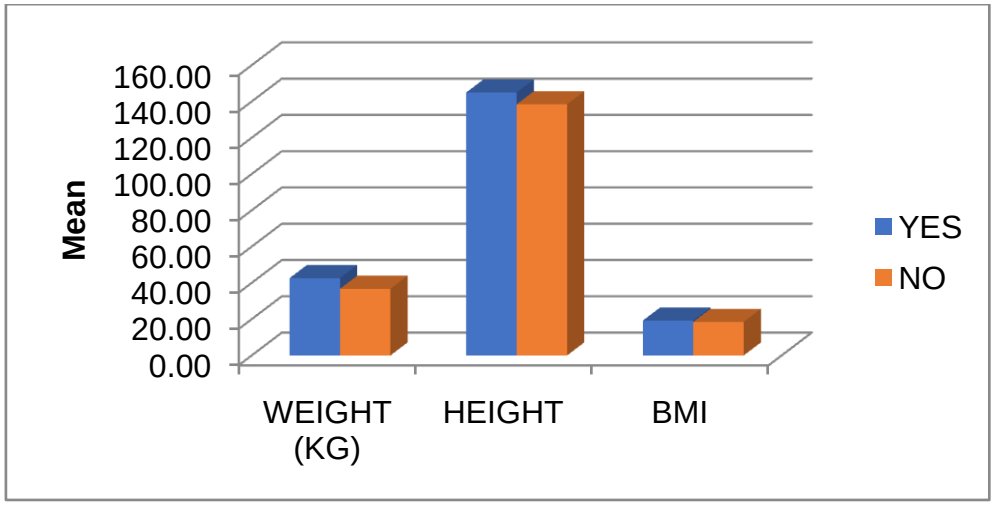
Nutritional status

By Weight, height and BMI, the composition of total dengue cases in ST plus Albumin and ST only group were not statistically significant with P value >0.05. Both the groups were comparable with respect to weight, height and BMI.

Table 02:- Comparison of Nutritional Status

	ST PLUS ALBUMIN				ST ONLY				Z	p-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
WEIGHT (KG)	42.61	18.99	43.00	22.7-57	36.75	15.29	38.10	25-48	-1.305	0.192
HEIGHT	144.94	19.49	150.00	128-160	138.45	25.63	146.80	121-154	-1.028	0.304
BMI	19.20	5.54	18.50	14.3-24.4	18.49	5.50	17.30	14.8-22.79	-0.564	0.573

Figure 03:- Comparison of Nutritional Status



OBESITY

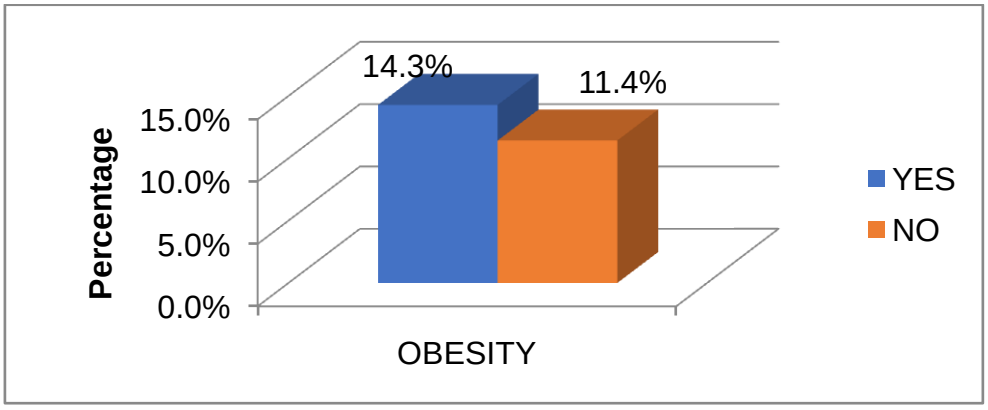
Among 70 patients enrolled, 9 were obese at admission, 5 patients (14.3%) belong to ST plus albumin group, while rest 4 (11.4%) belong to ST only group.

Difference was not significant in between two groups with p value of 0.574.

Table 03:- Comparison of Obesity

	ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
OBESITY	5	14.3%	4	11.4%	9	1.111	0.574

Figure 04:- Comparison of Obesity



Gender Distributions

Both the groups were matching with no statistically significant difference with respect to gender distribution, with P value of 0.803.

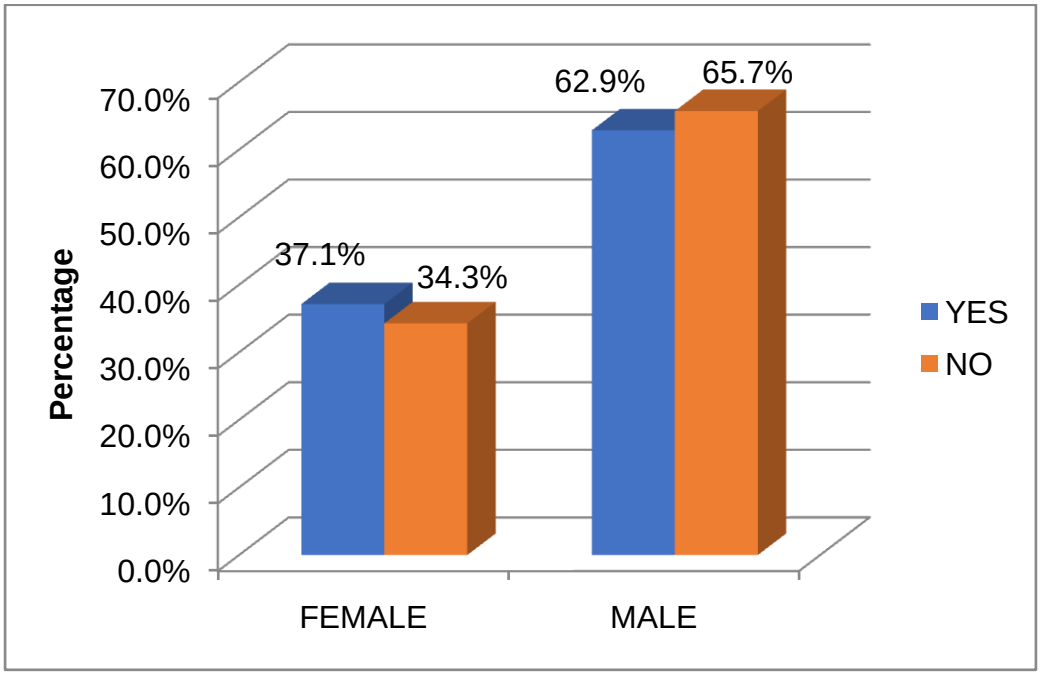
Out of 35 cases enrolled in ST plus albumin group, 13 cases (37.1%) patients were female and 22 cases, (62.9%) were male.

In ST only group, out of 35, 12 cases (34.3%) patients were female while 23 cases (65.7%) were male patients.

Table 04:- Gender Distributions

	GENDER	ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
SEX	FEMALE	13	37.1%	12	34.3%	25	0.062	0.803
	MALE	22	62.9%	23	65.7%	45		
Total		35	100.0%	35	100.0%	70		

Figure 05:- Gender Distributions



Phase at admission

In ST plus albumin group, 16 cases (45.7%) of total were admitted in febrile phase while 19 case (54.3%) presented in critical phase of Dengue.

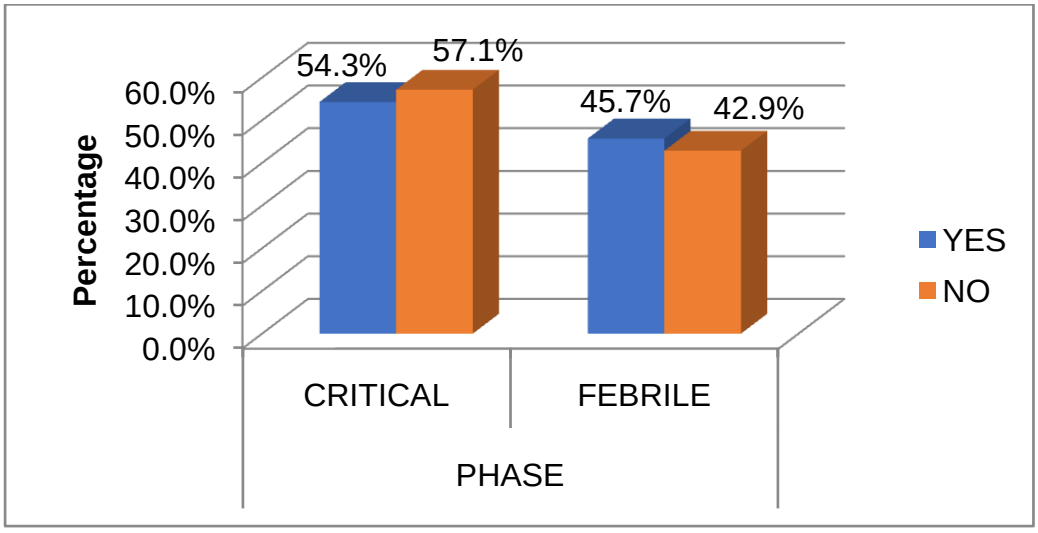
In ST plus albumin group, 20 cases (57.1%) of total were admitted in febrile phase while 15 patients (42.9%) presented in critical phase of Dengue.

Both the groups were equal with respect to the phase of presentation, as difference was not statistically significant with p value of 0.810.

Table 05:- Phase of Presentation

		ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
		No. of cases	%age	No. of cases	%age		
PHASE	CRITICAL	19	54.3%	20	57.1%	0.080	0.810
	FEBRILE	16	45.7%	15	42.9%		

Figure 06:- Phase of Presentation



Shock at admission

In ST plus Albumin group, out of 35 cases enrolled, 15 patients 42.9% had hypotensive shock alone while other 20 patients 57.1% had hypotensive shock with respiratory distress.

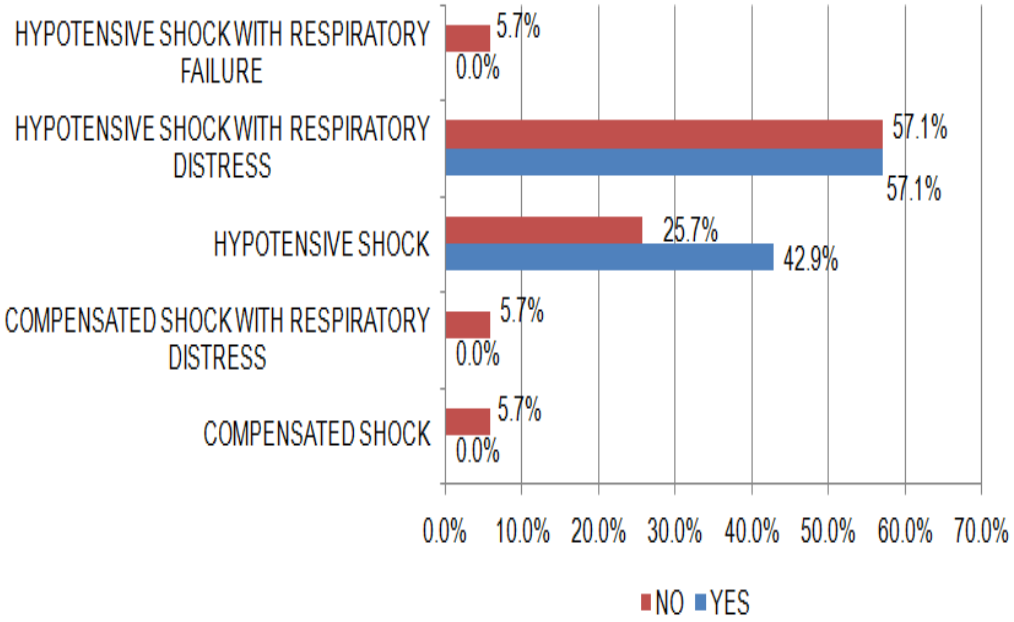
In ST only group, 4 (11.4%) patients had compensated shock at admission while 9 (25.7%) patients had hypotensive shock, 20 (57.1%) had hypotensive shock with respiratory distress and 2 (5.7%) had hypotensive shock with respiratory failure.

This difference in presentation was not statistically significant at presention with p value 0.202.

Table 06:- Type of Shock At Admission

		ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
ADMISSION DIAGNOSIS	COMPENSATED SHOCK	0	0.0%	2	5.7%	2	8.526	0.202
	COMPENSATED SHOCK WITH RESPIRATORY DISTRESS	0	0.0%	2	5.7%	2		
	HYPOTENSIVE SHOCK	15	42.9%	9	25.7%	24		
	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	20	57.1%	20	57.1%	40		
	HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE	0	0.0%	2	5.7%	2		
		35	100.0%	35	100.0%	70		

Figure 07 :- Type of Shock At Admission



Diagnosis of Dengue

All enrolled dengue cases were laboratory confirmed either by NS antigen or IgM ELISA.

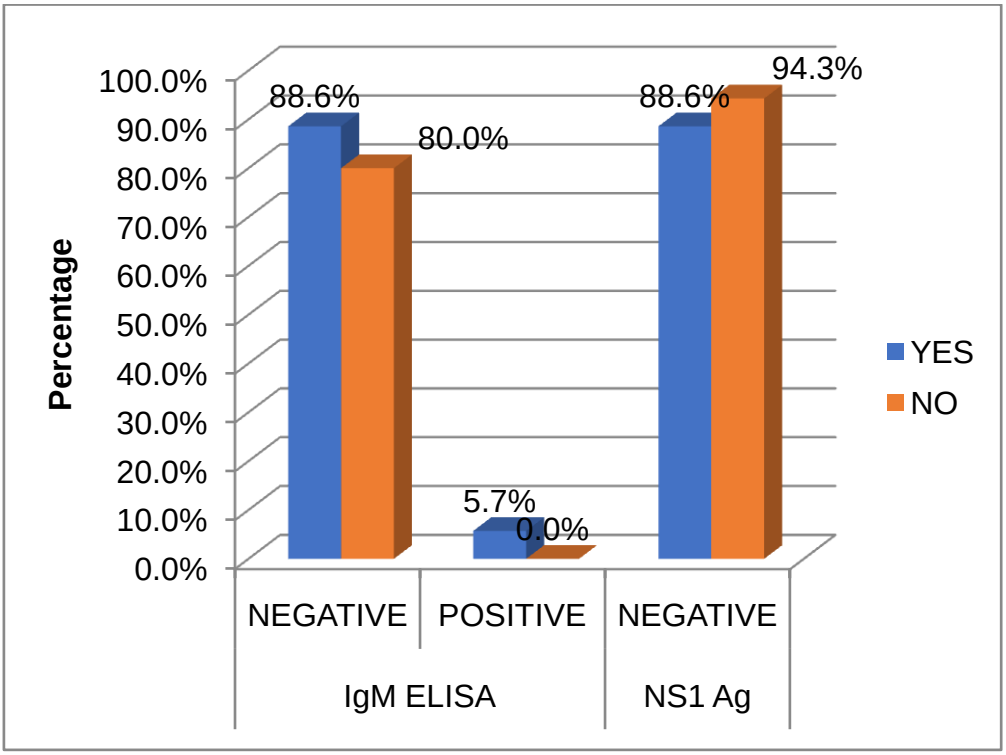
31 patients in ST Plus Albumin group were positive for both IgM ELISA and NS1 Ag, whereas 3 cases were only IgM positive with other 3 only NS1 Ag positive.

28 patients in ST only group were positive for both IgM ELISA and NS1 ag. 7 cases were only NS1Ag positive and other 2 only IgM positive.

Table 07:- Diagnosis of Dengue

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
IgM ELISA	POSITIVE	31	88.6%	26	74.3%	3.019	0.221
NS1 Ag	POSITIVE	31	88.6%	33	94.3%	2.063	0.357

Figure 08:- Diagnosis of Dengue



Comorbidities

Total 10 patients were reported with co-morbidities. Both the groups were relatable with respect to comorbidities.

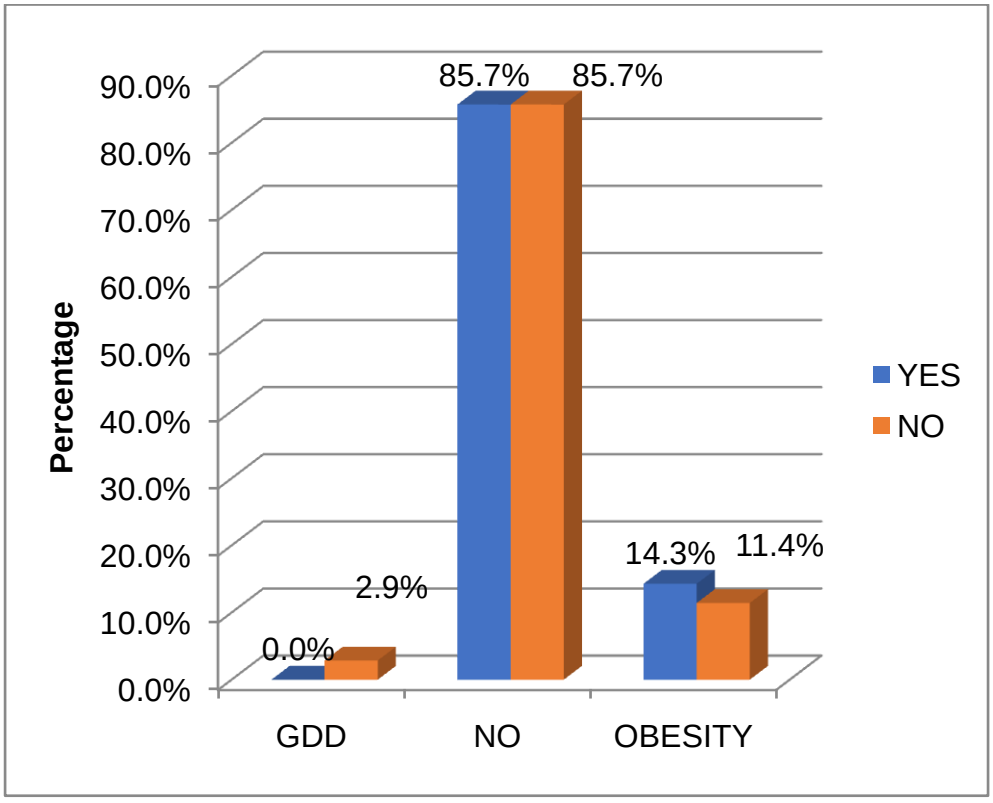
In ST plus albumin group, 5 patients (14.3%) were obese. In ST only group, 4(11.4%) were obese and 1 (2.9%) had global developmental delay.

Difference was not significant in two groups with p value of 0.574.

Table 08:- Comparison of Co-Morbidities

		ST PLUS ALBUMIN		ST ONLY		p-value
COMORBIDITIES	GDD	0	0.0%	1	2.9%	0.574
	NO	30	85.7%	30	85.7%	
	OBESITY	5	14.3%	4	11.4%	
Total		35	100.0%	35	100.0%	

Figure 09 :- Comparison of Co-Morbidities



PRISM Score at admission:-

Those in ST plus Albumin group were more sicker than patients in ST only group.

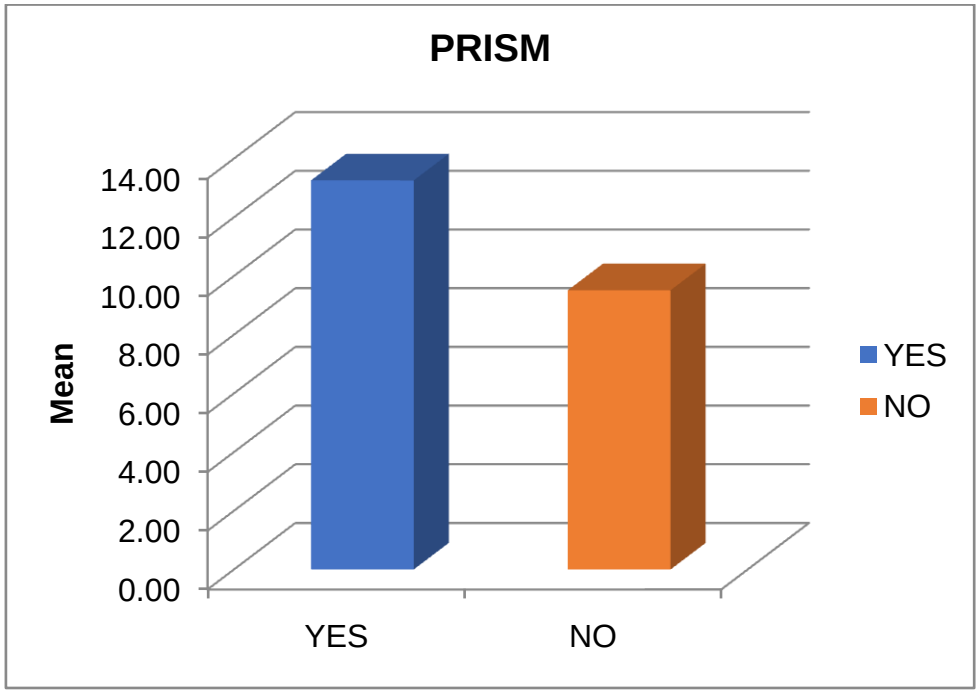
In ST plus Albumin group patients had Mean PRISM of 13.26± 6.55, while ST only group patients had Mean PRISM score of 9.51±5.63.

Difference was significant in between the groups, with p value of 0.003.

Table 09:- PRISM Score

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
PRISM	13.26	6.55	9.51	5.63	-2.960	0.003

Figure 10: PRISM Score



Need for PICU Admission

In ST plus Albumin group 30 cases (85.7%) were transferred to PICU for further management while other 5 patients (14.3%) improve following albumin infusion in emergency.

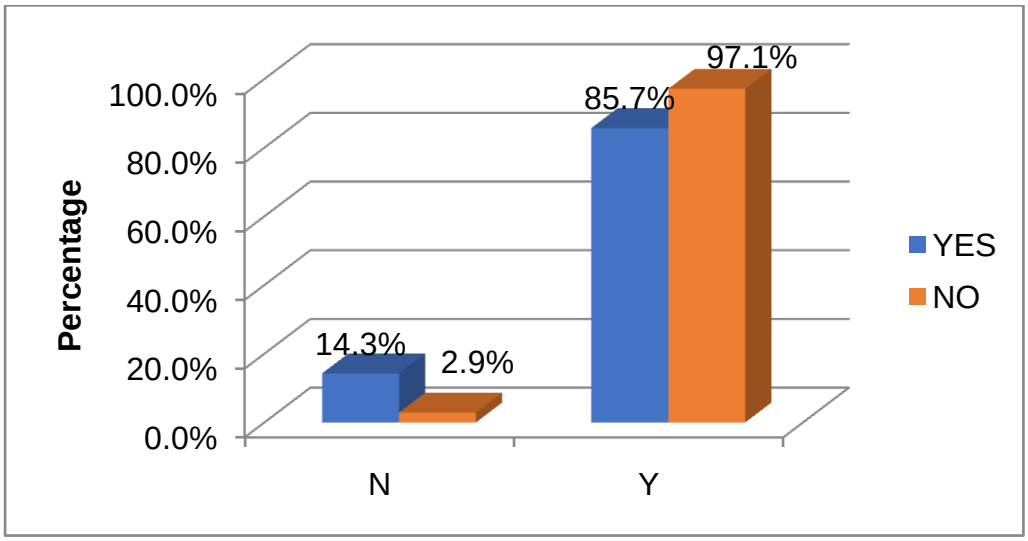
While ST only group, 34 cases (97.1%) need to be shifted to PICU following initial management in emergency.

Difference was non-significant with p-value of 0.198.

Table 10:- Need for PICU Admission

		ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
NEED FOR PICU ADMISSION	N	5	14.3%	1	2.9%	2.917	0.198
	Y	30	85.7%	34	97.1%		
Total		35	100.0%	35	100.0%		

Figure 11:- Need for PICU Admission.



FALL IN HEMATOCRIT

Mean Hct at admission and at 24 hours of admission were recorded.

Mean HCT at admission in ST plus group was 45.9±9.29 while lower 41.75±9.33 in ST only group. Difference was non-significant in Hematocrit at admission with p value of 0.098.

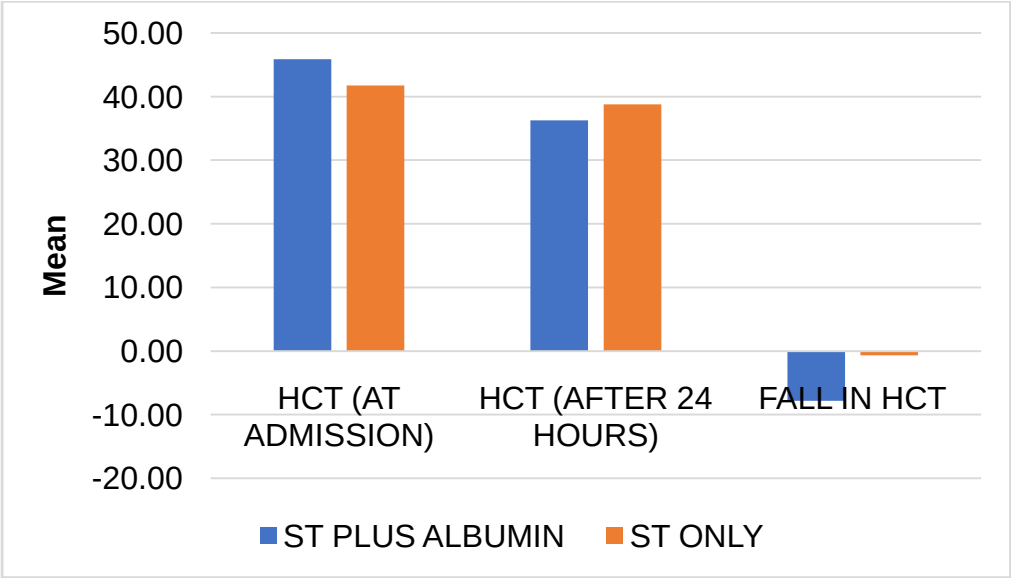
ST plus Albumin group had significant fall in hematocrit of mean 7.82±8.31 as compared to only 0.68±6.76 in ST only group.

Fall in hematocrit in ST plus Albumin group was significantly more following 24 hours of albumin infusion, as compared to ST only group, with p value of 0.001.

Table 11:- Fall In Hematocrit

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
HCT (AT ADMISSION)	45.90	9.29	41.75	9.33	-1.656	0.098
HCT (AFTER 24 HOURS)	36.28	7.50	38.80	7.65	-1.310	0.190
FALL IN HCT	-7.82	8.31	-0.68	6.76	-4.241	0.001

Figure12:- Fall In Hematocrit.



FLUID OVERLOAD

Comparison of fluid balance of Day 1, 2 ,3 of admission and Grand Positive fluid balance has been done between the two groups.

At 24 hours of admission, ST plus albumin group had mean positive fluid balance of 20.25±17.05 as compared to 34.98±28.48 in ST only group. Fluid balance was significantly higher in ST only group with p value of 0.037.

At 48 hours of admission, ST plus albumin group had mean negative fluid balance of -4.98±19.43 and34.15±109.54 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

At 72 hours of admission, ST plus albumin group had mean negative fluid balance of -15.74±15.45 as compared to 7.01±32.98 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

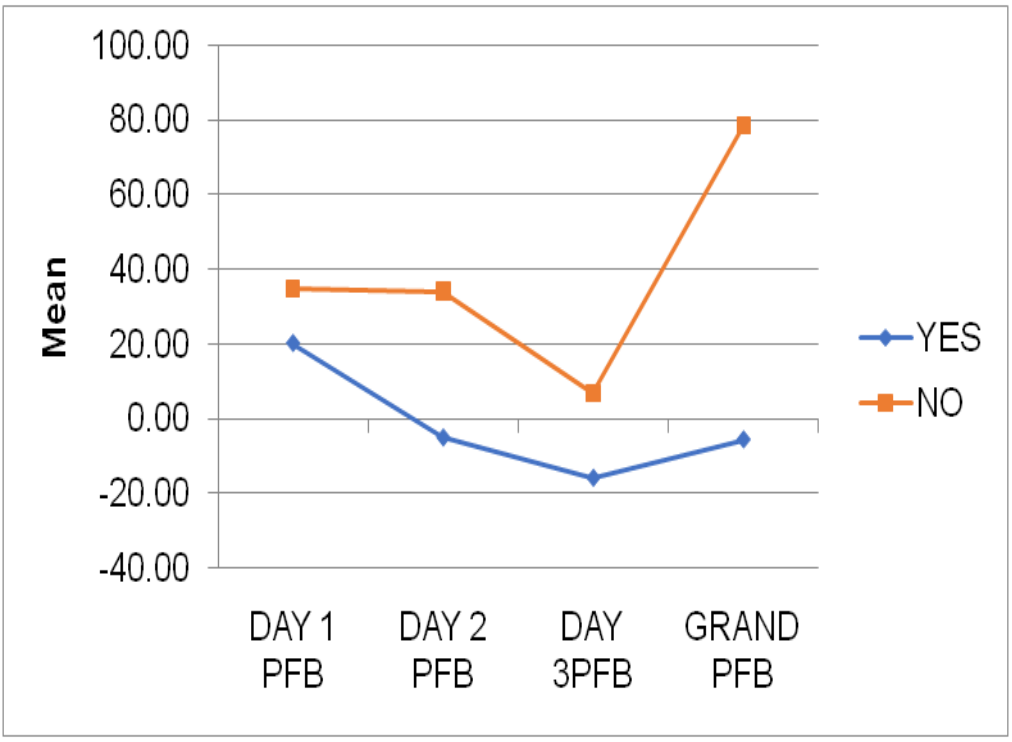
Grand fluid balance for 72 hours was negative in ST plus Albumin group of -5.49±36.37 as compared to positive balance of 78.48±134.67 in ST only group. Grand Fluid balance was significantly lower in ST plus Albumin group as compared to ST only group with p value of 0.001.

Thus, Albumin infusion lead to a cumulative negative balance uptil 3 days of admission as measured, eventually contributing to lesser need for diuretics, pleural tap, Ascitic tap and Dialysis.

Table 12:- Fluid Balance

	ST PLUS ALBUMIN				ST ONLY				Z	p-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR		
DAY 1 PFB	20.25	17.05	23.00	7.18-31.2	34.98	28.48	28.00	16.4-54.8	-2.085	0.037
DAY 2 PFB	-4.98	19.43	-2.60	-15.7-8.18	34.15	109.54	14.10	7.5-31.6	-4.053	0.001
DAY 3 PFB	-15.74	15.45	-12.60	-21--5.5	7.01	32.98	-0.85	-7.9-17.475	-3.949	0.001
GRAND PFB	-5.49	36.37	-9.00	-28-23.2	78.48	134.67	43.82	20-70.66	-4.875	0.001

Figure 13:- Fluid Balance



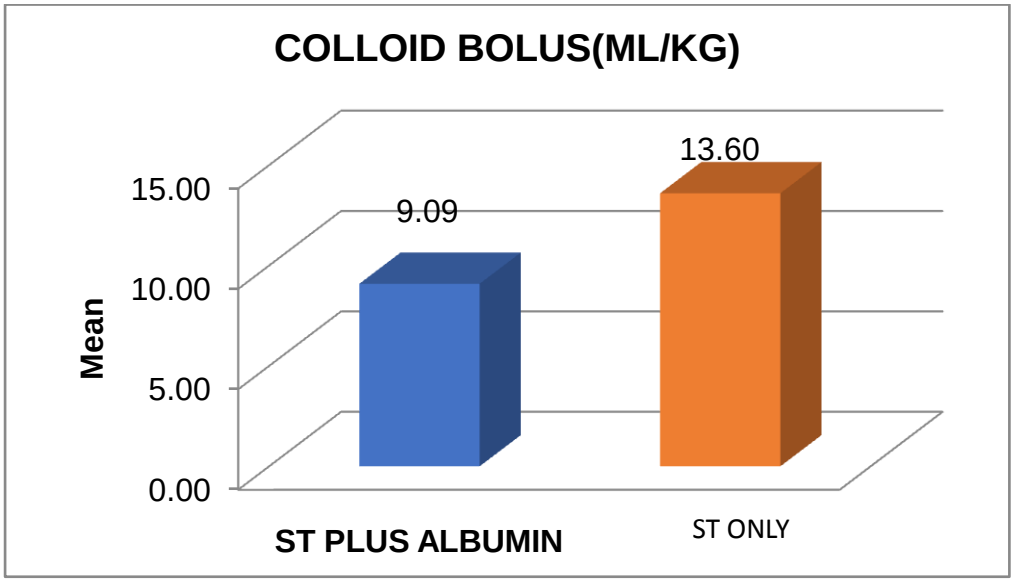
Need for Rescue Colloid Bolus

During initial resuscitation the total amount of rescue colloid (gel fusion) administered was significantly higher in ST only group (13.6±4.9) as compared to ST plus Albumin group (9.09±2.02). Difference was significant with P value of 0.005.

Table 13:- Rescue Colloid Bolus

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
COLLOID BOLUS(ML/KG)	9.09	2.02	13.60	4.90	-2.790	0.005

Figure 14:- Rescue Colloid Bolus.



Pleural Effusion

Incidence of Pleural effusion was significantly higher in ST only group as compared to ST plus Albumin group with P value of 0.001.

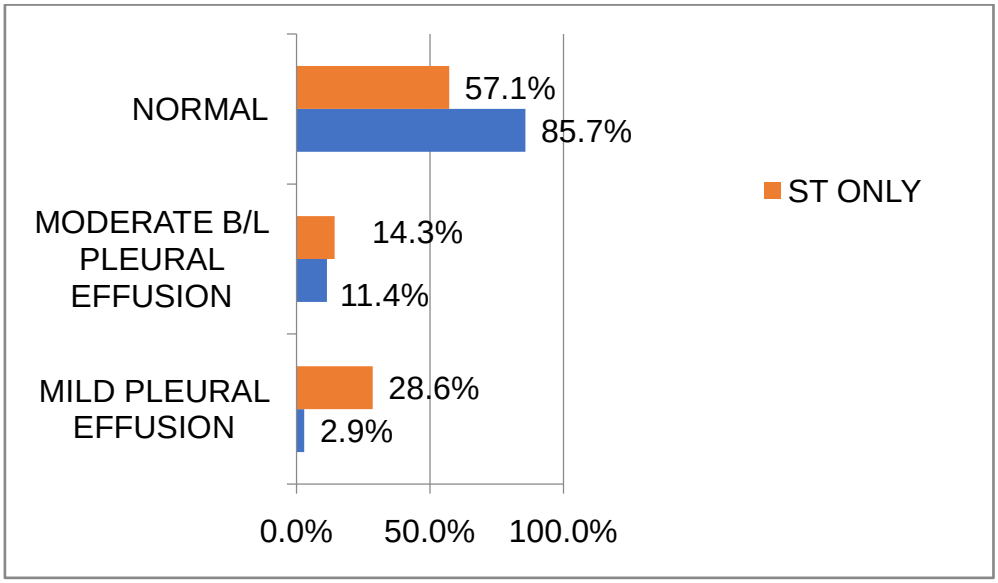
In ST plus Albumin group, 1 patient (2.9%) had mild pleural effusion while other 4 (11.4%) had moderate pleural effusion on chest x-ray.

In ST only group, 10 patients (28.6%) had mild pleural effusion while other 5 patients (14.3%) had moderate pleural effusion.

Table 14:- Pleural Effusion

	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
MILD PLEURAL EFFUSION	1	2.9%	10	28.6%	22.5	0.001
MODERATE B/L PLEURAL EFFUSION	4	11.4%	5	14.3%		
NORMAL	30	85.7%	20	57.1%		
Total	35	100.0%	35	100.0%		

Figure 15:- Pleural Effusion



ASCITES

Incidence of Ascites was significantly higher in ST only group as compared to ST plus Albumin group with P value of 0.001.

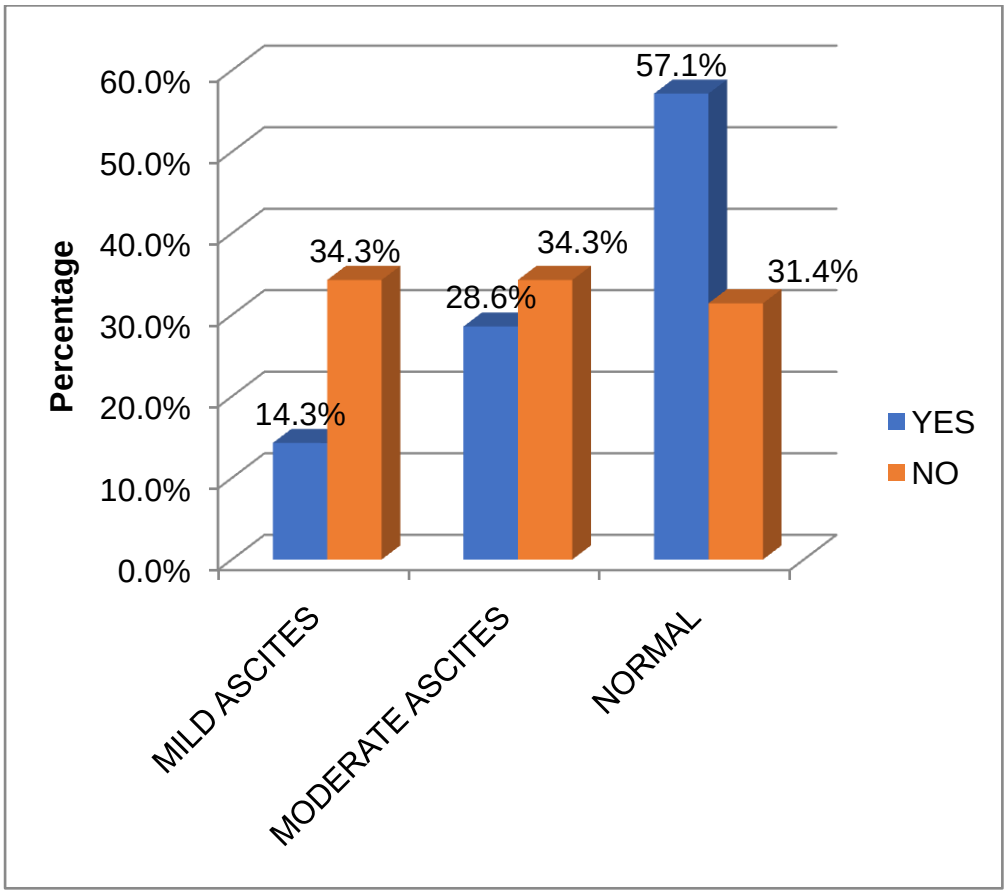
In ST plus Albumin group, 5 patients (14.3%) had mild ascites while other 10 patients (28.6%) had moderate ascites on USG Abdomen.

In ST only group, 12 patients (34.3%) had mild ascites while other 12 (34.3%) had moderate ascites.

TABLE 15:- Ascites

	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
MILD ASCITES	5	14.3%	12	34.3%	10.02	0.018
MODERATE ASCITES	10	28.6%	12	34.3%		
NORMAL	20	57.1%	11	31.4%		
Total	35	100.0%	35	100.0%		

Figure 16:- Ascites.



Need for oxygen.

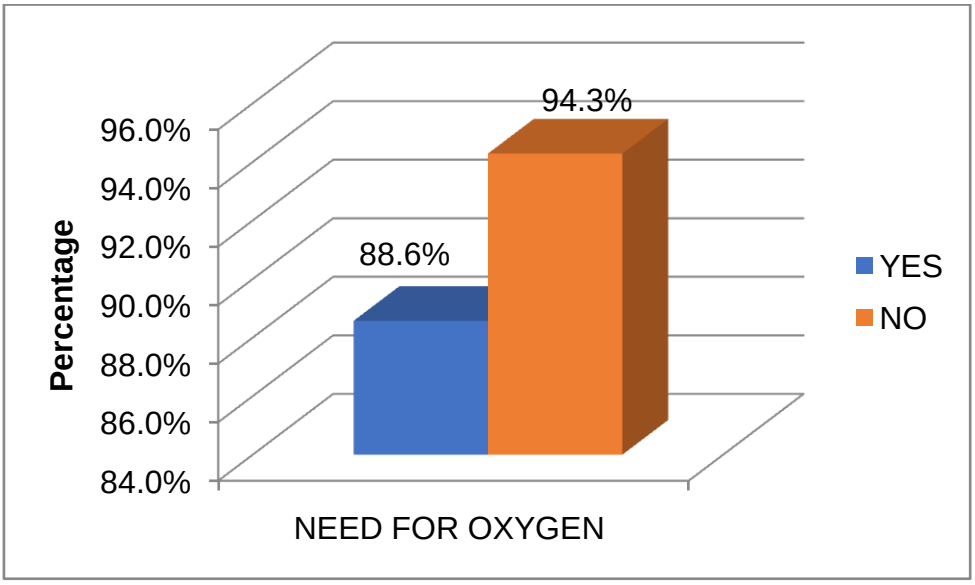
Need for oxygen support by prongs was higher but not significant in ST Only group as compared to ST plus group with P value of 0.69.

In ST plus Albumin group, 31 patients (88.6%) needed oxygen support by prongs while in ST only group, 33 patients (94.3%) required oxygen support by prongs.

TABLE 16:- Need for Oxygen

	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
NEED FOR OXYGEN	31	88.6%	33	94.3%	0.159	0.69

Figure17:- Need for Oxygen



Duration of Oxygen by prongs

Total duration of oxygen requirement by prongs was higher in ST only group as compared to ST plus group, but the difference was not statistically significant with p value of 0.577.

Mean duration of oxygen support by prongs in ST plus albumin group was 1.94±0.93, while in ST only group was 2.16±1.19.

TABLE 17:- Duration of Oxygen by Prongs.

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
OXYGEN (Days)	1.94	0.93	2.16	1.19	-0.558	0.577

Need for NIV support.

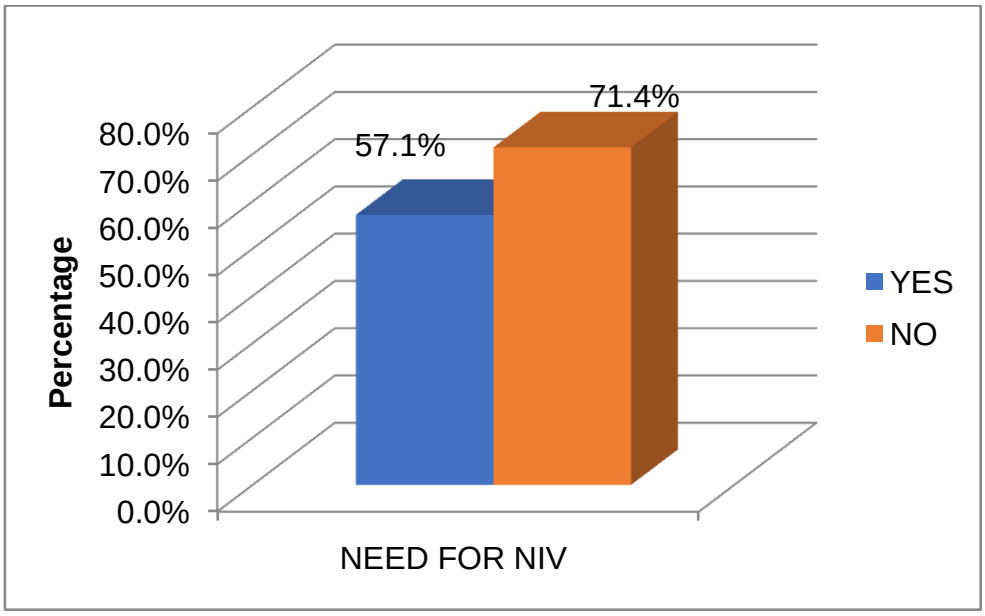
Need for NIV support by prongs was higher but not significant in ST Only group as compared to ST plus group with P value of 0.212.

In ST plus Albumin group, 20 patients (57.1%) needed NIV support while in ST only group, 25 patients (71.4%) required NIV support.

TABLE 18:- Need for NIV Support

	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
NEED FOR NIV	20	57.1%	25	71.4%	1.556	0.212

Figure 18:- Need for NIV Support



Duration of NIV support

Total duration of NIV requirement was higher in ST only group as compared to ST plus group, but the difference was not statistically significant with p value of 0.550.

Mean duration of NIV support in ST plus albumin group was 2.25±1.07, while in ST only group was 2.08±1.04.

Table 19:- Duration of NIV Support

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
NIV (DAYS)	2.25	1.07	2.08	1.04	-0.597	0.550

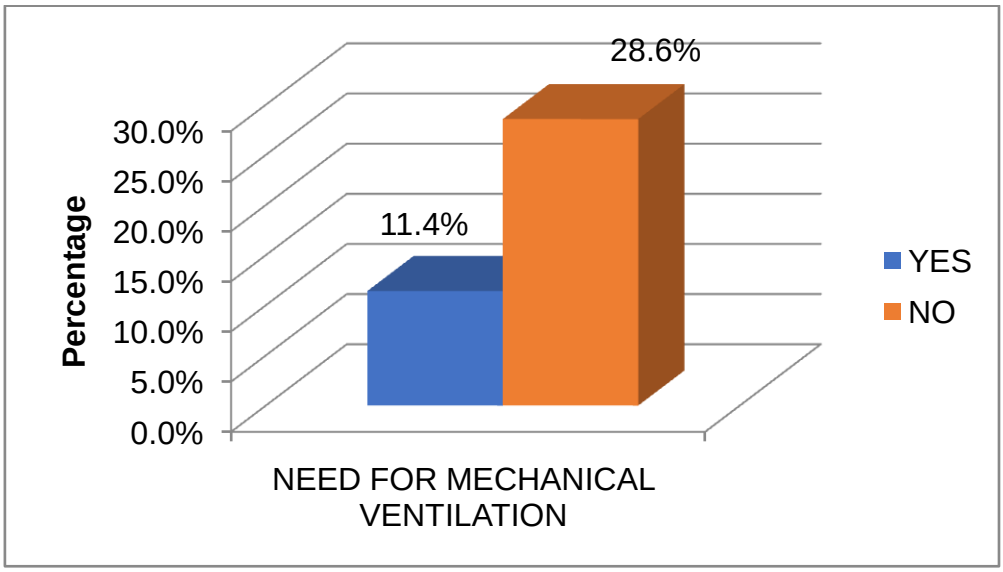
Need for Ventilator support

In ST plus Albumin group, 4 patients (11.4%) needed Ventilator support while in ST only group, 10 patients (28.6%) required Ventilator support. Need for ventilator support was higher in ST only group as compared to ST plus Albumin group. Difference was near significant with p value of 0.078.

Table 20: Need for Ventilator support

	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
NEED FOR MECHANICAL VENTILATION	4	11.4%	10	28.6%	4.158	0.078

Figure 19:- Need For Ventilator Support



Duration of Ventilator support

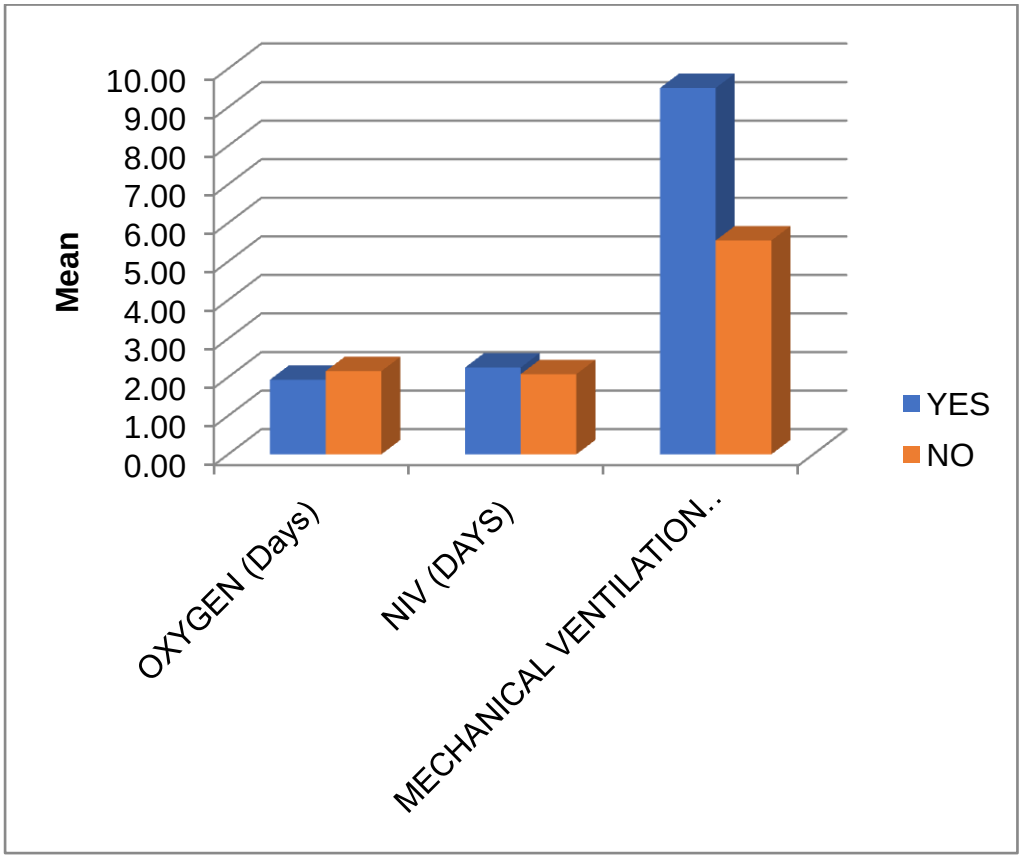
Total duration of ventilator requirement was higher in ST only group as compared to ST plus group, but the difference was not statistically significant with p value of 0.166.

Mean duration of ventilator support in ST plus albumin group was 9.50±5.26, while in ST only group was 5.55±4.11.

Table 21:- Duration of Ventilator Support

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
MECHANICAL VENTILATION (DAYS)	9.50	5.26	5.55	4.11	-1.385	0.166

Figure 20:- Duration on Oxygen Prongs, NIV and Ventilation



Need For Inotropes

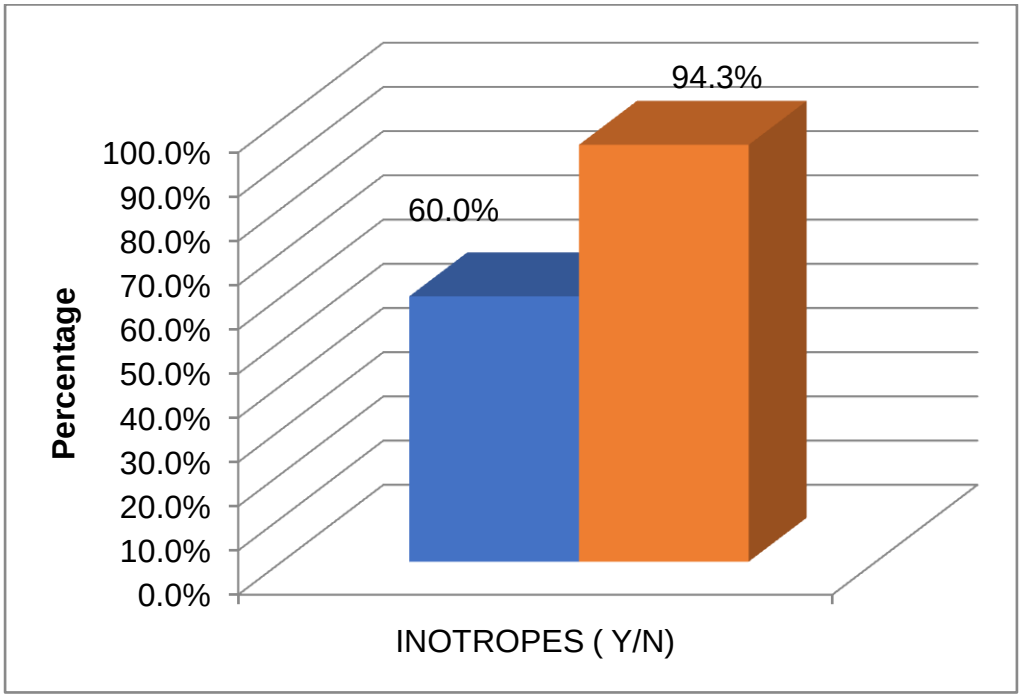
Need for inotropic support was significantly higher in ST only group as compared to ST pus group with p value of 0.001.

In ST plus Albumin group, among 35, only 21 (60%) cases needed inotropic support up while in ST only group,33 (94.3%) patients were on inotropic support.

Table 22:- Need for Inotropic Support

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
INOTROPES (Y/N)	Y	21	60.0%	33	94.3%	11.667	0.001

Figure 21:- Need for Inotropic Support



Inotropic Score

The inotropic score and its upgrade vasoactive inotropic score were used to objectively quantify the degree of hemodynamic support.

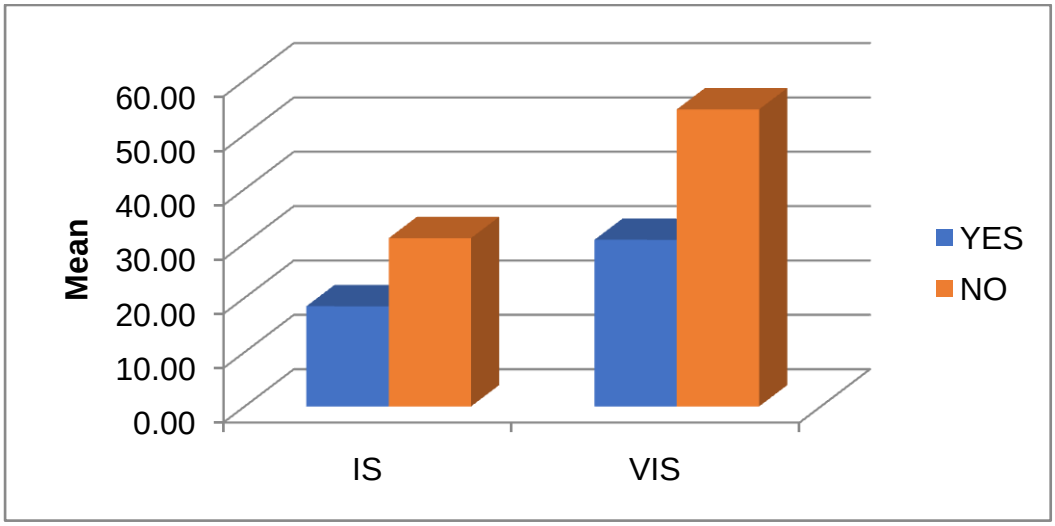
Mean Inotropic score was higher in ST only group (34.07±0.788) as compared to ST plus group (18.4±15.5), the difference was not significant with p value of 0.431.

Mean Vasoactive inotropic score was also higher in ST only group (64.9±0.818) as compared to ST plus group (30.67±29.26), though the difference was not statistically significant with p value of 0.413.

Table 23:- Inotropic and Vasoactive Inotropic Score

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
IS	18.44	15.55	30.97	34.07	-0.788	0.431
VIS	30.67	29.26	54.67	64.99	-0.818	0.413

Figure 22:- Inotropic and Vasoactive Inotropic Score



Duration of Inotropes

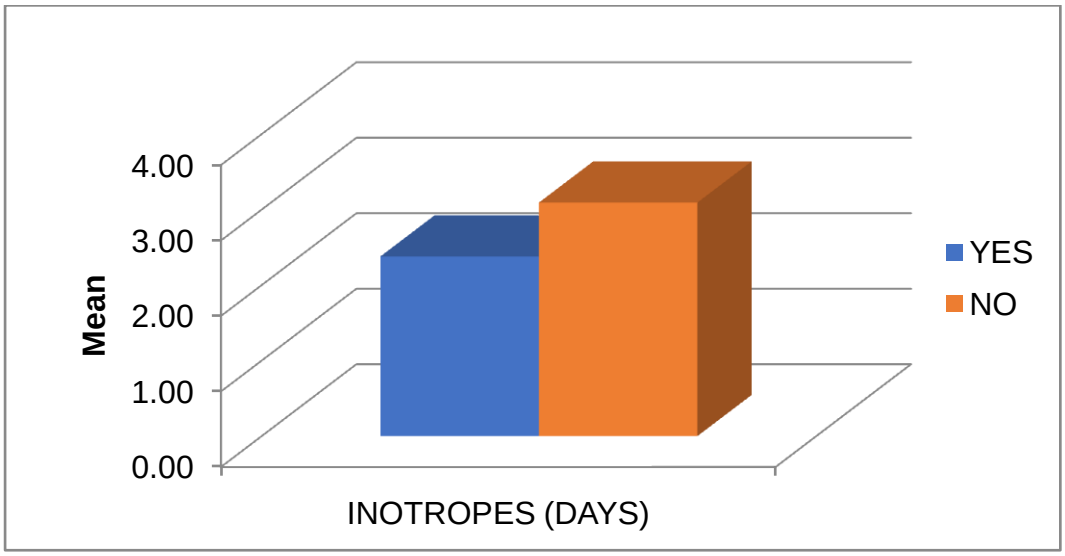
In ST albumin group, average duration for which inotropes were required was shorter (2.38±2.62) as compared to ST only group (3.09±1.63).

Difference in duration of inotropes was statistically significant between two groups with p value of 0.008.

Table 24:- Duration of Inotropes

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
INOTROPES (DAYS)	2.38	2.62	3.09	1.63	-2.661	0.008

Figure 23:- Duration of Inotropes.



Incidence of AKI

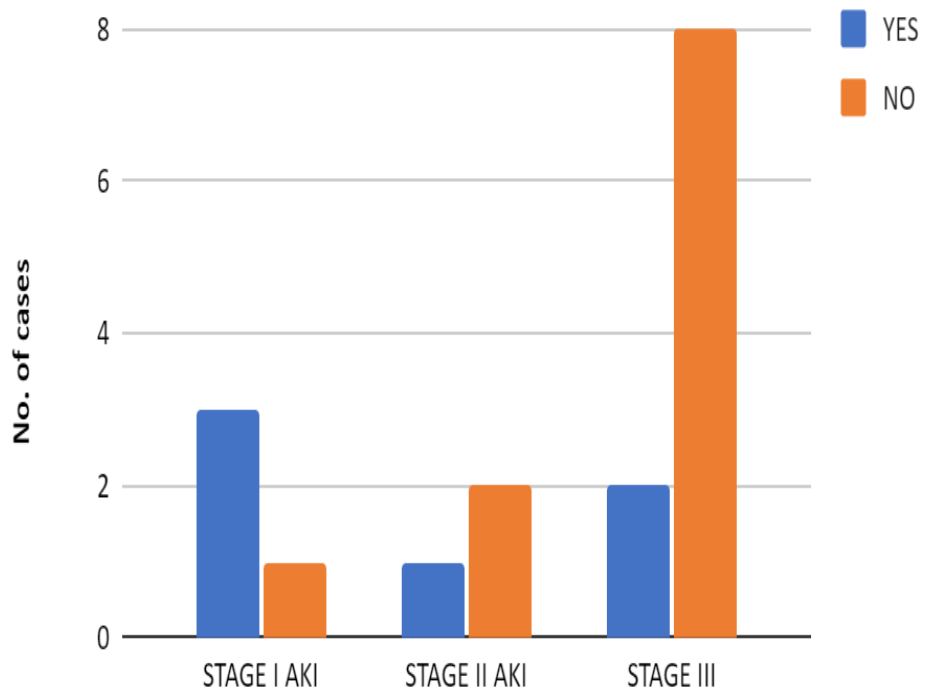
Of 35 patients in ST plus group, only 6 patients (17.1%) develop AKI. while in ST only group 11 patients (31.4%) had AKI. Though the incidence was higher in ST only group but the difference was not statistically significant, with P value of 0.163.

When Stage II & Stage III AKI cases were combined, the incidence was higher in ST only group (28.5%) as compared to ST plus group (8.57%) with near significance (P value= 0.065).

Table 25:- Incidence of AKI

	ALBUMIN	YES		NO		Total	Chi-square value	p-value
AKI	Y	6	17.14%	11	31.4%	17	1.942	0.163
STAGE I	Y	3	8.57%	1	2.80%	4	3.398	0.065
STAGE II	Y	1	2.80%	2	5.70%	3	0.006	0.939
STAGE III	Y	2	5.70%	8	22.80 %	10	2.341	0.126
STAGE II & III	Y	3	8.57%	10	28.5%	13	3.398	0.065

Figure 24:- Incidence of AKI



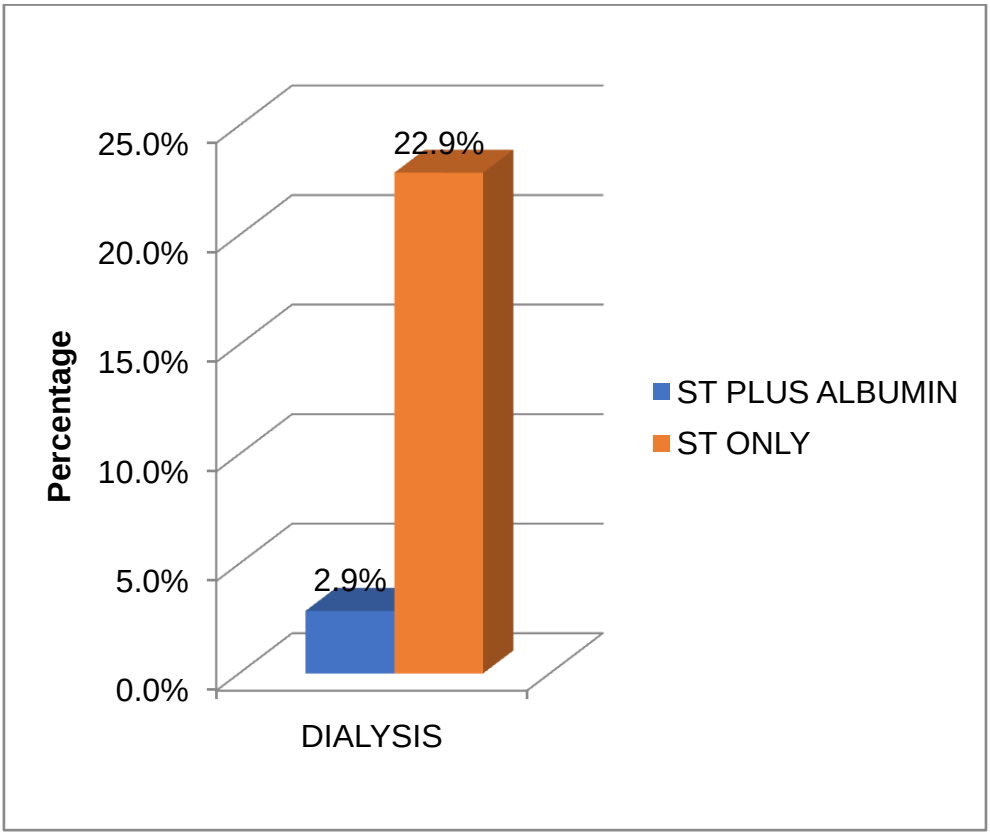
Need for Dialysis

Only 1 patient (2.9%) underwent dialysis in ST plus group while 8 patients (22.9%) underwent dialysis in ST only group. Need for dialysis was significantly higher in ST only group with p value of 0.028.

Table 26:- Need for Dialysis

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
DIALYSIS	Y	1	2.9%	8	22.9%	6.248	0.028

Figure 25:- Need for Dialysis.



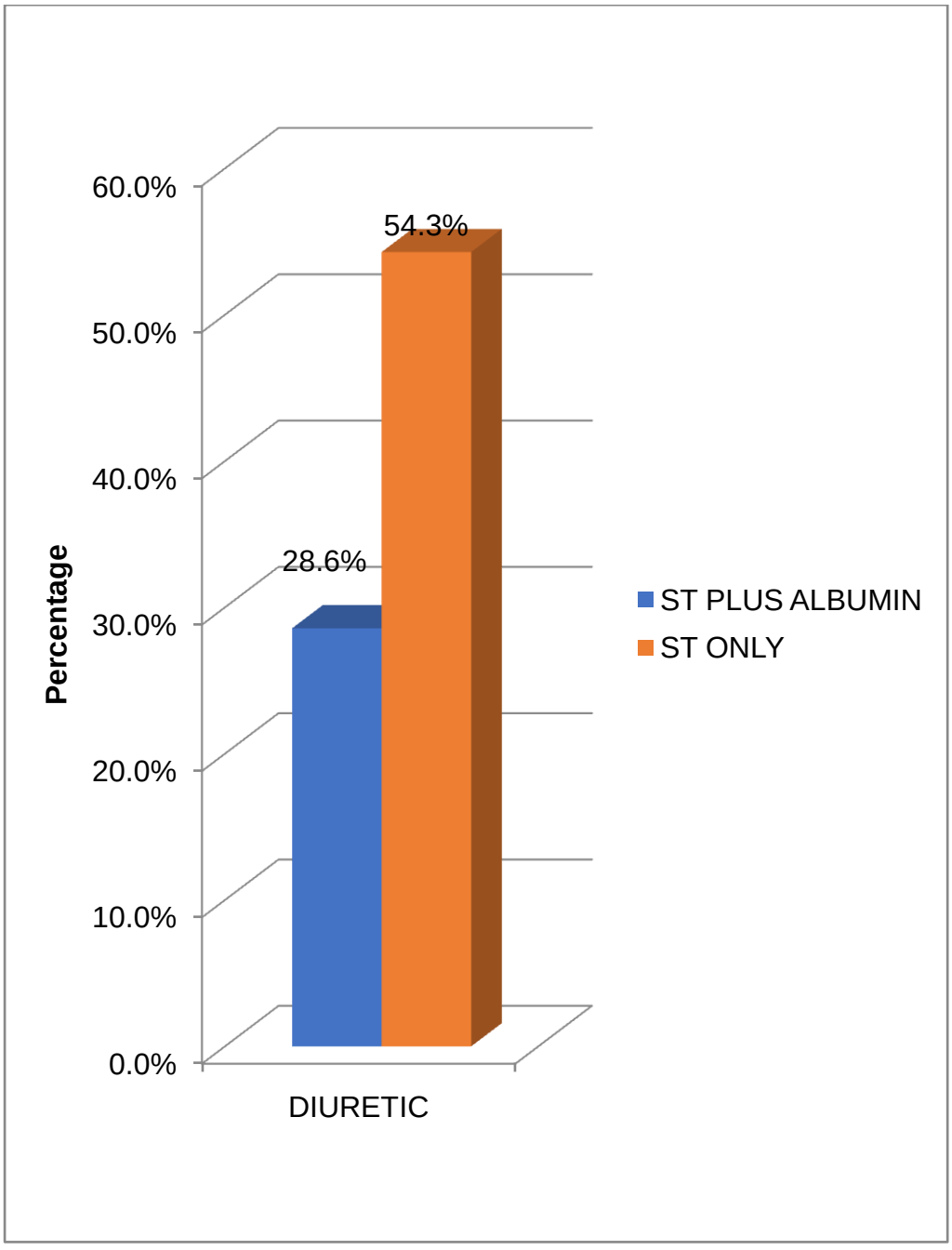
Need for Diuretics

10 patients (28.6%) were on diuretic support in ST plus albumin group, while 19 patients (54.3%) needed diuretic support in ST only group. Need for diuretic support was significantly higher in ST only group with p value of 0.029.

Table 27:- Need for Diuretics

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Chi-square value	p-value
DIURETIC	Y	10	28.6%	19	54.3%	4.769	0.029

Figure 26:- Need for Diuretics



Need for PRBC

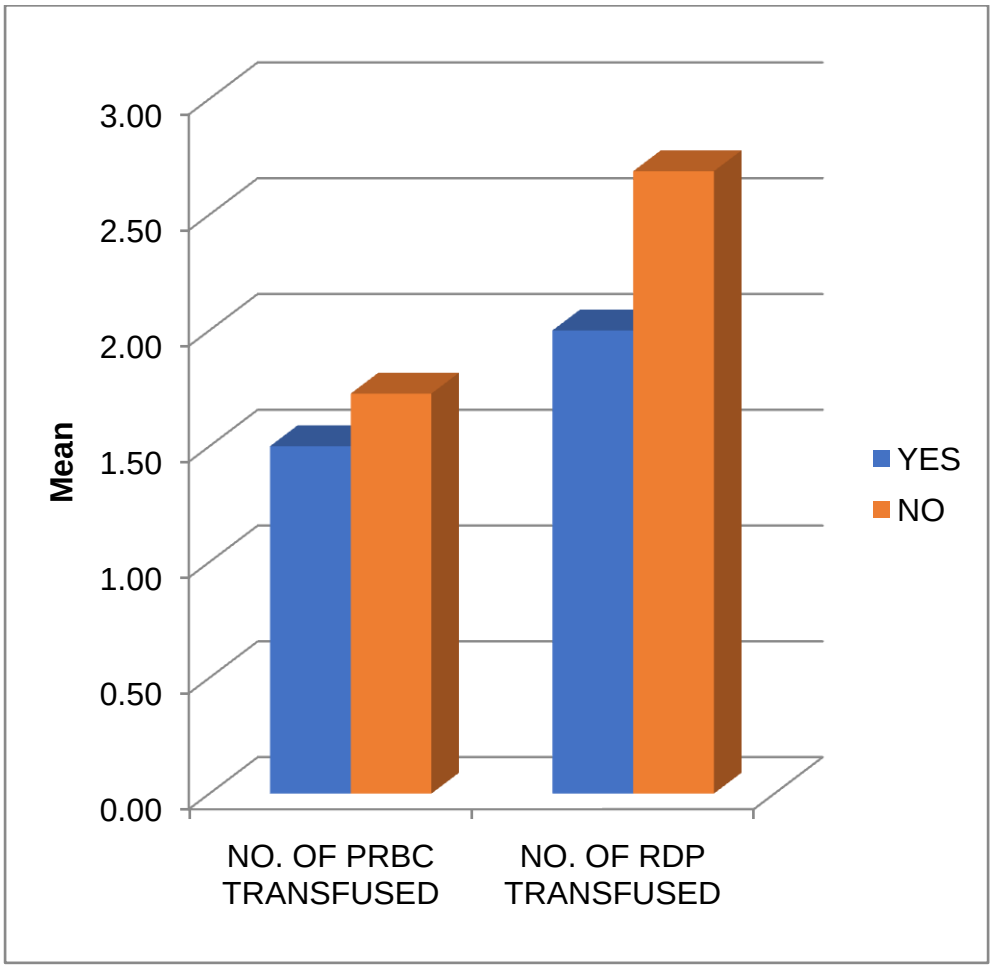
Of 35 patients in ST plus Albumin group only 6 patients (17.1%) required PRBC transfusion while 11 patients (31.4%) in ST only group needed PRBC transfusion.

Need for PRBC transfusion was not significantly higher in ST only group with p value of 0.163.

Table 28:- Need for PRBC

		ALBUMIN ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
		No. of cases	%age	No. of cases	%age			
PRBC TRANSF	N	29	82.9%	24	68.6%	53	1.942	0.163
	Y	6	17.1%	11	31.4%	17		
Total		35	100.0%	35	100.0%	70		
NO. OF PRBC TRANSFUSED	1	5	14.3%	6	17.1%	11	2.868	0.412
	2	0	0.0%	3	8.6%	3		
	3	0	0.0%	1	2.9%	1		
	4	1	2.9%	1	2.9%	2		
Total		6	17.1%	11	31.4%	17		

Figure 27:- Need for PRBC



MAJOR BLEEDING

Out of 35 patients enrolled, in Standard treatment plus Albumin group, 5 patients (14.3%) had major bleeding.

While 15 patients (42.9%) in ST only group had major bleeding.

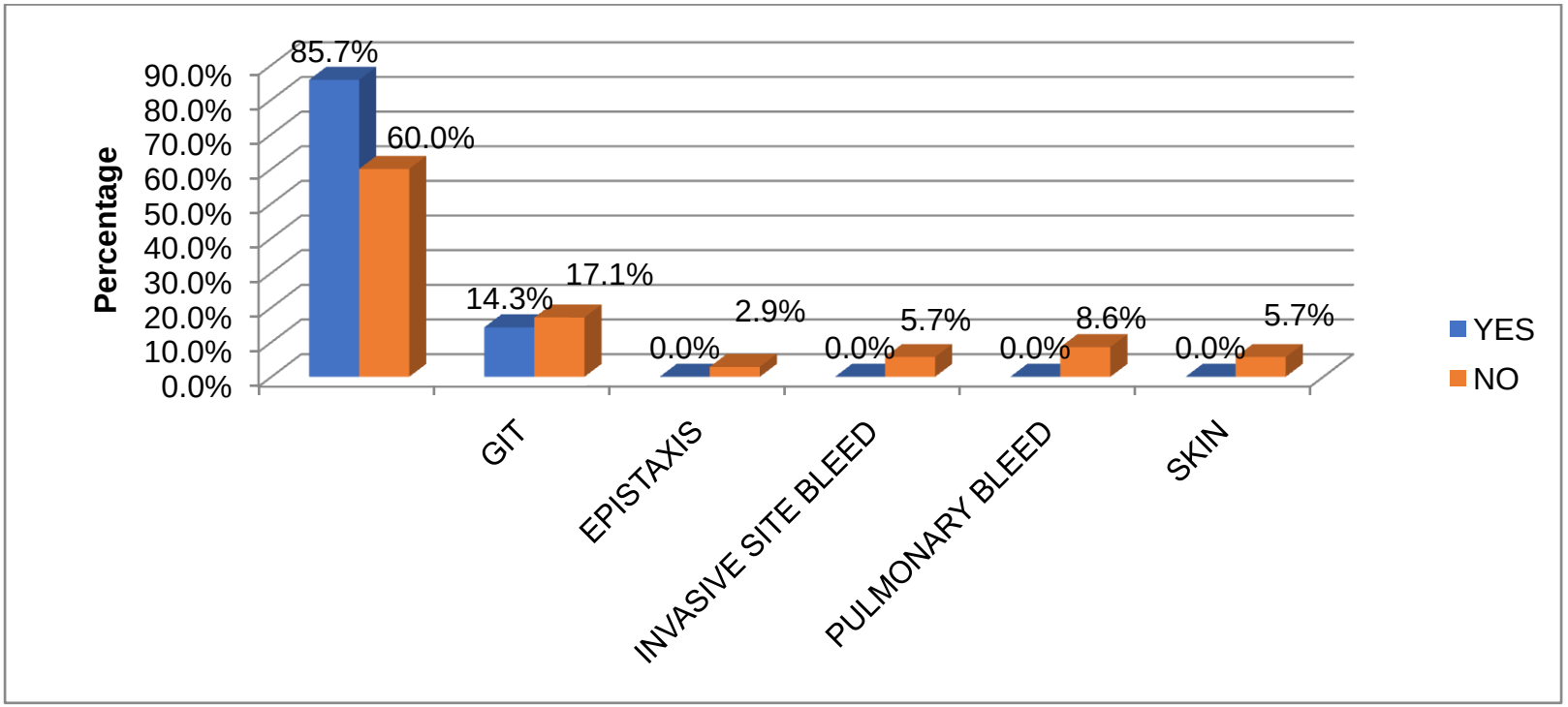
Incidence of bleeding was significantly higher in ST only group with P value 0.008.

In Standard treatment plus Albumin group, among those with major bleed, 4 patients had gastro-intestinal bleed (Hematemesis, Malena) while one patient developed purpura with hematoma. Among 15 patients in ST only group, who had major bleed 10 cases developed GIT bleeding, 1 had epistaxis, 2 had bleeding from invasive sites ,4 patients had pulmonary hemorrhage while 2 develop skin manifestation (purpura, ecchymosis and hematoma).

Table 29:- Incidence of Major Hemorrhage

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
SITE OF BLEED	NO BLEED	30	85.7%	20	57.1%	50	9.733	0.083
	GIT	4	11.4%	6	17.1%	10		
	EPISTAXIS	0	0.0%	1	2.9%	1		
	INVASIVE SITE	0	0.0%	2	5.7%	2		
	PULMONARY HAEMORRHAGE	0	0.0%	4	11.4%	4		
	SKIN	1	2.9%	2	5.7%	3		
Total		35	100.0%	35	100.0%	70		

Figure 28:- Incidence of Major Hemorrhage



FINAL OUTCOME

Of 35 patients enrolled in ST plus Albumin group, 34 patients were discharged while 1 expired.

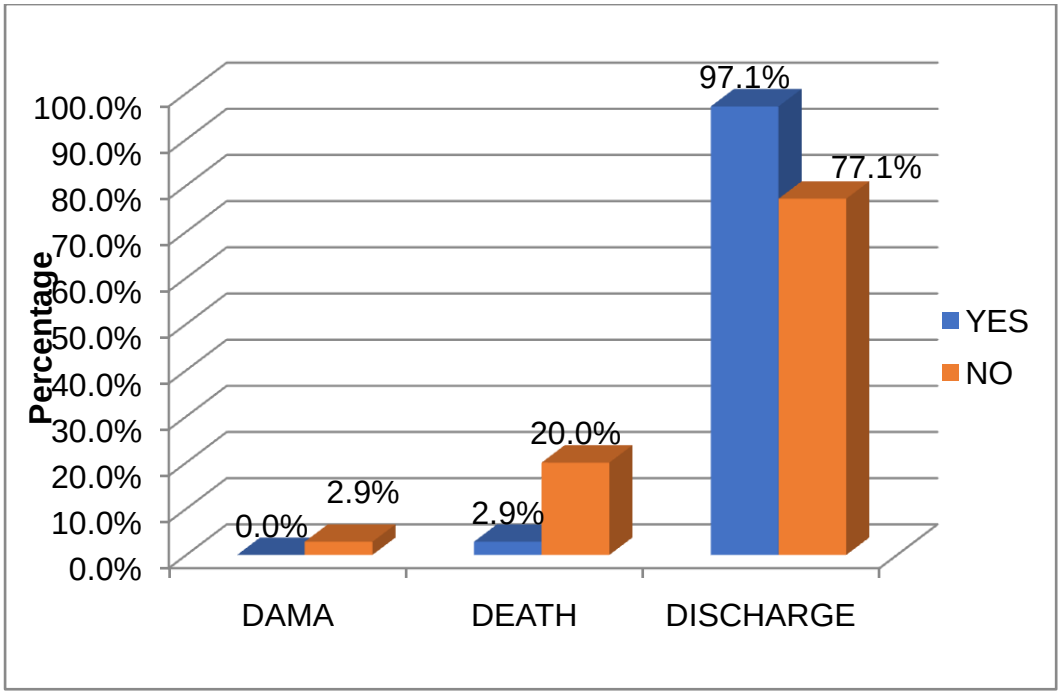
In ST only group, 27 patients were discharged, while 7 patients expired during treatment and 1 went discharge against medical advice.

The final outcome of survival was significantly better in ST plus Albumin group as compared to ST only group (P=0.043).

Table 30:- Comparison of Final Outcome

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
OUTCOME	DAMA	0	0.0%	1	2.9%	1	6.303	0.043
	DEATH	1	2.9%	7	20.0%	8		
	DISCHARGE	34	97.1%	27	77.1%	61		
Total		35	100.0%	35	100.0%	70		

Figure 29:- Comparison Of Final Outcome



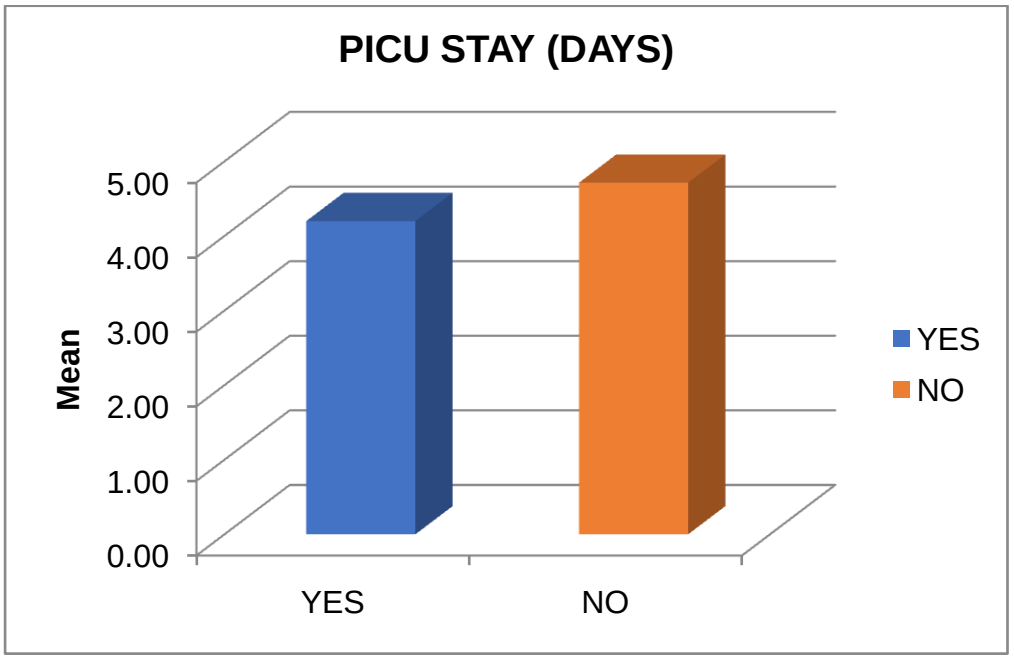
Duration of PICU stay

In ST plus Albumin group, Mean Length of PICU stay among 35 patients was 4.25 ±4.50 as compared to 4.71± 2.98 in ST only group. Duration was longer in ST only group but the difference was not statistically significant (P=0.099).

Table 31:- Duration of PICU Stay

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
PICU STAY (DAYS)	4.20	4.50	4.71	2.98	-1.652	0.099

Figure 30:- Duration of PICU Stay



Need for Therapeutic Thoracocentesis & Paracentesis

One patient in ST plus Albumin group, underwent therapeutic pleural tap. None of the patient in ST plus Albumin group required therapeutic paracentesis.

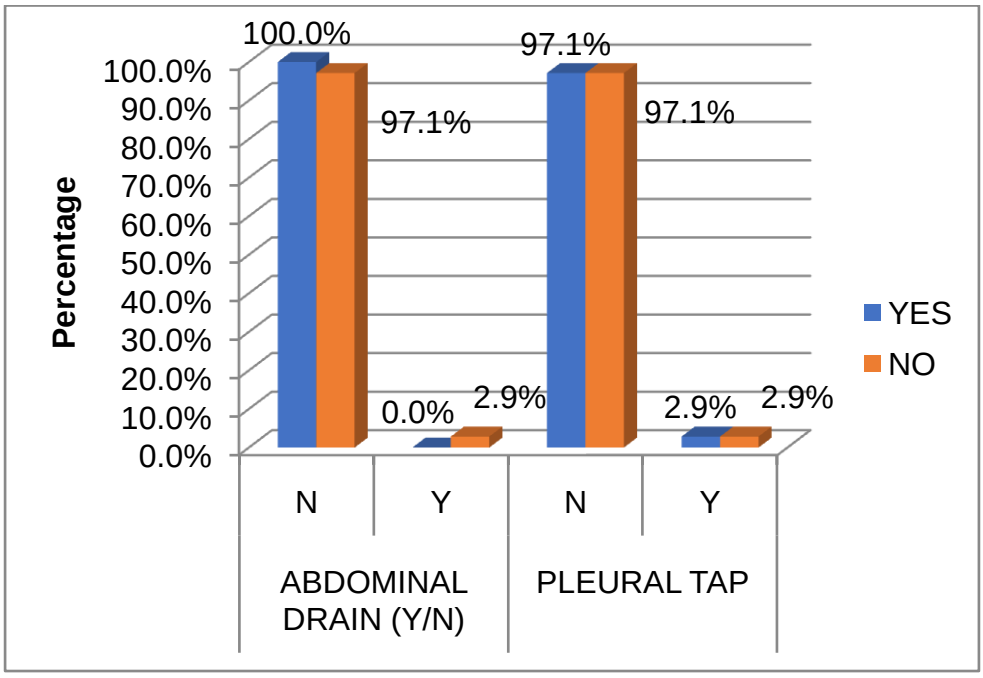
While ST only group, 1 patient (2.9%) required therapeutic paracentesis for massive ascites while another patient underwent therapeutic pleural tap for left pleural effusion.

Need for therapeutic tap was not significantly different in two groups, with p value of 1.

Table 32:- Need for Therapeutic Tap

	ALBUMIN	ST PLUS ALBUMIN		ST ONLY		Total	Chi-square value	p-value
ABDOMINAL DRAIN (Y/N)	N	35	100.0%	34	97.1%	69	1.014	0.314
	Y	0	0.0%	1	2.9%	1		
PLEURAL TAP	N	34	97.1%	34	97.1%	68	0.000	1.000
	Y	1	2.9%	1	2.9%	2		
Total		35	100.0%	35	100.0%	70		

Figure 31:- Need for Therapeutic Tap



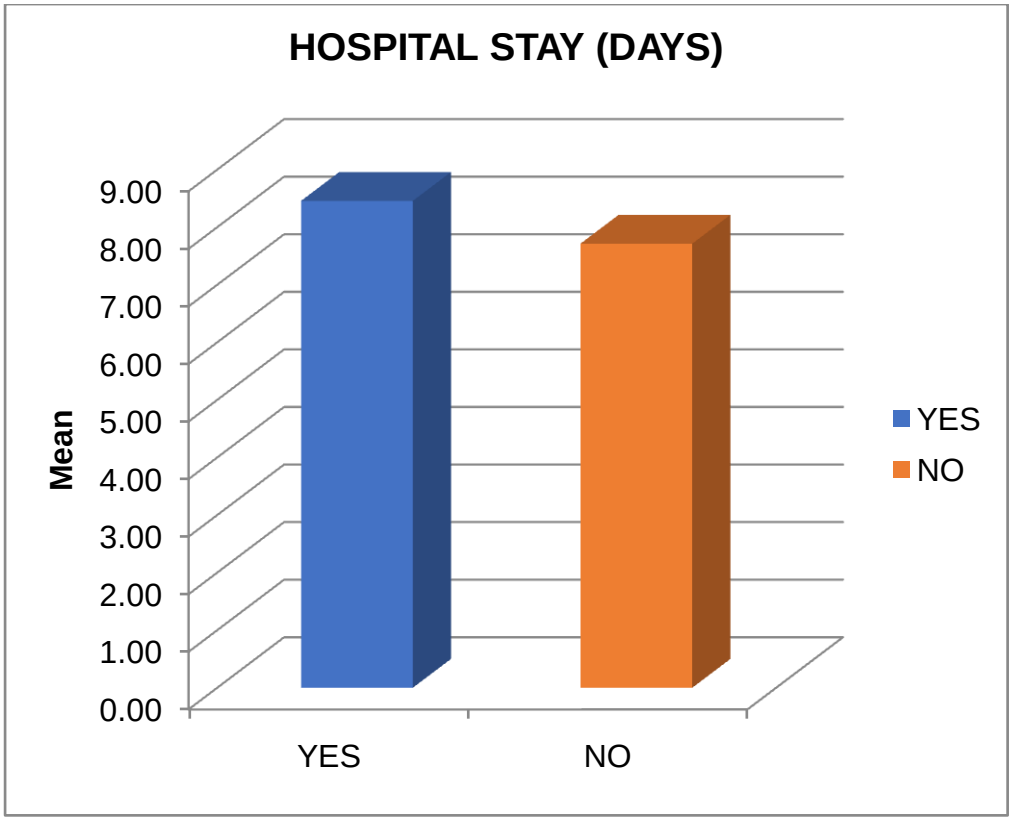
Length of Hospital stay

Mean length of hospital stay of 8.46± 6.33 days was longer in ST plus albumin group as compared to ST only group of 7.71±4.17 days. Difference was not significant with p value of 0.652.

Table 33:- Duration of Hospital stay

	ST PLUS ALBUMIN		ST ONLY		Z	p-value
	Mean	SD	Mean	SD		
HOSPITAL STAY (DAYS)	8.46	6.33	7.71	4.17	-0.451	0.652

Figure 32:- Duration of Hospital Stay



DISCUSSION

In India, during rainy season, the most prevalent reason for child presenting to the hospital is dengue infection. Though various trials have been conducted until recently, but data from these controlled trials fails to conclude onto the most appropriate treatment regimens for severe dengue infection.

Less prevalent form of dengue infection i.e. severe dengue infection is among the leading cause of death in India in pediatric population. About 5% of patients infected with dengue demonstrate severe symptoms. [78] But another study in India demonstrated that about 35% of dengue cases are severe. [79] Mortality rate associated with severe dengue varies among countries, ranging from 12-45%.Based on previous trials, the introduction of intensive intravenous fluid resuscitation in severe dengue shock patients resulted in marked reduction in the mortality rate from approximately 20% to only 2%. But until recently no particular intravenous fluid solution is yet approved for resuscitation regimen.

WHO standard treatment guidelines for dengue, standardized initially in 1974, later updated in 1986, 1994 and 1997. These guidelines suggested that in patients with shock, Ringer's lactate or normal saline solution @20ml/kg should be infused promptly following admission to hospital. However, those in continued or refractory shock with persistent pulse pressure of less than 10mmHg, the guidelines recommend that colloidal solutions to be administered at dosages of 10-20ml/kg. [80]

One of the major treatment difficulties among severe dengue patients presenting with shock is to manage hypovolemia quickly, avoiding fluid overload and its consequences. Iatrogenic fluid overload, along with

underlying capillary leakage, may eventually multiply the risk of mortality in severe dengue cases.

Crystalloid solutions have significantly lower intravascular resistance time as compared to colloids. Thus, use of crystalloids in large volume for volume resuscitation may precipitate pulmonary edema along with systemic increase in vascular permeability that involved the pulmonary microcirculation. [81] Pulmonary fluid overload has been observed in several autopsy studies of fatal dengue patients, often following aggressive fluid resuscitation with crystalloids. [82]

In one prospective study conducted among trauma patients, study demonstrates that colloidal solutions stabilized the hemodynamic status quickly and needed significantly low volumes of fluid for resuscitation as compared to patients resuscitated with crystalloid solutions. A significantly higher frequency of non- cardiogenic pulmonary oedema was noticed among those treated with Ringer's lactate. [83] Another trial conducted among those with hypovolemic circulatory collapse, revealed that colloid solutions are more efficient as resuscitation fluids than crystalloids, resulting in lower fluid overload and pulmonary edema. [84]

Most of the patients enrolled in these controlled studies were adults undergoing cardiac or aortic surgery or those presented with septic shock. In view of different underlying pathophysiology, results of these studies cannot be extrapolated onto specific situation in children with Severe Dengue shock.

Previous studies conducted among patients presented with severe dengue shock, to compare clinical outcomes among patients resuscitated with either crystalloids or colloids solutions were not adequately powered and thus do not confer reliable evidence onto the choice of resuscitation fluid among severe dengue patients.

Our study suggests that use of albumin as a preferred resuscitation colloid solution was significantly effective for initial resuscitation of children with severe dengue shock. This study, focuses on a single disease entity for which volume resuscitation is integral and usually a sole intervention required. It indicated that in patients with capillary leakage, albumin infusion was more useful than other colloids for majority of patients with severe dengue.

Although previous studies have explored the impact of albumin infusion in resuscitating critically ill and sepsis patients, only very few investigators have focused on the use of albumin containing solutions in patients with severe dengue, especially those with severe dengue shock. Our study was the only study focusing entirely on Severe dengue shock, which are the most important and specific subset of dengue infection, determining the outcome and for that reason this study is separated from previous studies. Furthermore, to our knowledge, no study has yet compared albumin infusion with standard WHO guidelines in severe dengue patients up to now. In this study, the effect of albumin as a resuscitation fluid on mortality as an endpoint in severe dengue shock was investigated.

Those patients with persistent shock despite initial resuscitation with 40ml/kg of crystalloid/colloid fluids, received rescue albumin infusion and showed significant improvement in mortality and morbidity outcome.

No adverse event was noted following albumin administration either on the intrinsic coagulopathy or clinical bleeding manifestations or on the cumulative fluid overload.

Various theories regarding ultra filtration mechanisms in micro-vasculature are based on starling principle of a balanced equilibrium among the antagonistic oncotic and hydrostatic pressures suggesting the role of oncotic pressure in fluid flow but current theories revealed

that, instead of endothelial cells themselves, the glycocalyx is the major regulator of fluid flow across the vessels. As per these theories, some plasma proteins especially serum albumin, adsorb onto the positive residues in the glycocalyx membrane and restrict the process of ultrafiltration. It is believed that albumin is probably washed out of this glycocalyx membrane during dengue infections, thus aggravating fluid flow. Replacement of albumin with the use of synthetic colloids, may temporarily reduce the flow and eventually permeate through the membrane at different rates, depending on molecular size. [85] Thus, colloids may alter the selective permeability of the vascular barrier, reducing outward fluid flow and in meantime allow the low oncotic pressure of vessels to rise until the colloid molecules themselves are washed out of the capillaries. However, crystalloid solutions have no direct action on glycocalyx membrane, additionally they equilibrate promptly throughout the intravascular and extravascular spaces resulting in lower efficacy compared to colloids.

In addition to its relevance to dengue, major strength of this study in the general discussion among crystalloids versus colloid solutions was steady nature of the underlying illness and the idea that volume resuscitation is the most critical therapeutic intervention.

As seen in this study, a subgroup analysis of SAFE trial suggested higher efficacy of albumin solutions comparative to crystalloids among patients with severe sepsis with varying underlying etiology, [86] most of the patients were suspected to have an associated capillary leak syndrome. Whereas, the underlying pathology resulting in vascular leak with increased permeability associated with severe sepsis is quite different from pathology associated with severe dengue shock. This study, shows a clear benefit with the use of albumin infusion only among children with severe dengue with shock, due to capillary leakage. As in SAFE trial, this study monitors survival as primary endpoint.

Unlike SAFE trial, this study was non randomized, conducted in a single hospital staffed by same core group of doctors throughout the study.

This study conducted in a center with PICU facilities enrolled a total of 70 children with Severe dengue. The study emphasizes the efficiency of albumin infusion along with standard treatment in promptly replenishing the hypovolemic status and improving the end organ comparative to Standard treatment alone. 25% Albumin infusion was associated with significantly faster and better improvement in hematocrit values and, blood pressures with lesser need for inotropes as compared to standard treatment alone.

Our results suggests that final hemodynamic replenishment can be more efficiently restored in severe dengue patients with the infusion of hypertonic albumin. Aggressive and judicious treatment with albumin infusion within first 24 hours of presenting to hospital in persistent dengue shock, may decrease the cumulative fluid eventually needed to replace the intravascular space, thus, ultimately reduce the possibility of third space loss and its complications. For those receiving standard treatment alone, outcome was poor with longer recovery period among those who survived.

As the final results suggested a significant difference in primary outcome related to albumin infusion as compared to Standard treatment alone, but a significant difference was noted in disease severity between two treatment groups of severe dengue at admission, with respect to PRISM score.

Children enrolled in Standard treatment plus albumin group likely had explosive disease at presentation or present late in refractory shock as shown by significantly higher PRISM score in the group receiving albumin along with standard treatment. Intravascular volume was significantly depleted and pulse pressure measured was narrower by

the time child presents to hospital. Generally, outcomes in profound shock are largely determined by severity at presentation and initial resuscitation.

This study suggests that despite more profound shock at presentation, than other treatment group, albumin infusion along with aggressive management offer significant advantage over standard treatment alone in terms of primary outcome as well as secondary outcome variables.

In a similar study carried out at the Centre for Tropical diseases in Ho Chi Minh city, [87] study further strengthen the evidence of significant improvements in hematocrit, pulse pressure, and cardiac index among children with severe dengue shock who received colloids rather than crystalloid solution for initial resuscitation.

Most of the studies conducted previously, evaluate the role of albumin transfusion during onset of early critical period of dengue, with the aim to access the efficacy of therapeutic intervention in reducing the progression of disease, morbidity and mortality.

As seen in a previous study conducted in Pediatric ICU in Apollo hospital Chennai, [88] we study the role of albumin infusion in addition to the standard WHO recommendations in the sickest patients with dengue.

But that report by Suchitra et al, describe several ICU and ED- targeted interventions in addition to albumin infusion as a preferred colloid, these were applied in an anticipatory manner in addition to standard WHO recommendations in severe dengue patients.

Interventions practiced in a standard treatment plus group in this previous study includes use of albumin as a preferred colloid in patients who remained in shock despite 30ml/kg of crystalloid over 3h, 2 hourly proactive monitoring for IAP in patients who received >30ml/kg

fluid in 3-4h followed by immediate treatment if elevated IAP, high risk intubation management including pre-emptive strategies to prevent peri-intubation cardio respiratory decompensation, multipronged approach to control hemorrhage and bleeding and sustained low-efficiency dialysis was preferentially used for patients with diuretic resistant fluid overload/AKI.

In our report we studied the efficacy of just a single intervention of albumin infusion as a preferred colloid in those with persistent shock despite initial resuscitation in ST plus group. As in previous study, gel fusion was preferred colloid in Standard treatment only group, based on WHO recommendations.

Demographic terms of age, weight and gender were similar between two groups.

Mean age at admission was 10.9years in ST plus group while 10 years in ST only group.

Comorbidities were compared among both the groups. In Standard treatment plus albumin group, 14.3% patients while in ST only group, 14.2%patients had comorbidities. The difference was not significant p value of 0.574.

Males comprise 62.9% of total in ST plus group while 65.7% of those enrolled in ST only group.

Admission hematocrit was comparable in both the groups with no dissimilarity in two groups while in previous study, the presenting hematocrit recorded was notably lesser in ST group compared to ST+ group with p-value of 0.001.so, patients in previous study had lower hematocrit, thus less severe shock then our cohort.

In our study, the mean PRISM III score was higher in Standard treatment plus albumin group as compared to Standard treatment only group. On the other hand, on previous study median PRISM III score was 4 in ST group and 5 in ST plus group. Thus, our cohort includes comparatively sicker patients of severe dengue in profound shock.

Also, the difference between both the groups in terms of PRISM score in our study, might be due to yearly severity difference among patients due to different strains.

In previous study, 43.3% among ST group while 31.6 % among ST + group, presented in hypotensive shock. Whereas, in our study, all patients in ST plus group were in hypotensive shock at admission, and also 91.4% of patients in Standard treatment only group were hypotensive. These details again suggestive of aggressive disease in our cohort with a higher proportion presenting in hypotensive shock.

All patients enrolled in ST plus albumin group, received 25% albumin infusion as a preferred colloid, if shock persist along with standard treatment within 24 hours of admission to hospital. None of patients in ST only group received albumin infusion, whereas gel fusion was preferred colloid as per WHO guidelines and inotropes were added if shock persist.

In previous study, Albumin infusion was the most frequently used intervention in the ST+ group.1 patient in ST group and 16 patients among 38 enrolled in ST + group received albumin infusion.

At 24 hours of admission, ST plus albumin group had mean positive fluid balance of 20.25$\pm$17.05 as compared to 34.98$\pm$28.48 in ST only group. Fluid balance was significantly higher in ST only group with p value of 0.037.

At 48 hours of admission, ST plus albumin group had mean negative fluid balance of -4.98±19.43 as compared to 34.15±109.54 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

At 72 hours of admission, ST plus albumin group had mean negative fluid balance of -15.74±15.45 as compared to 7.01±32.98 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

Grand fluid balance for 72 hours was negative in ST plus Albumin group of -5.49±36.37 as compared to positive balance of 78.48±134.67 in ST only group. Grand Fluid balance was significantly lower in ST plus Albumin group as compared to ST only group with p value of 0.001.

When compared with similar study by Suchitra Ranjit, similar results were noticed. Grand fluid balance for 72 hours in ST plus Albumin group was 10.02 as compared to 17.8 in ST only group. Grand Fluid balance was significantly lower in ST plus Albumin group as compared to ST only group with p value of 0.009.

Thus, Albumin infusion led to a cumulative negative balance uptil 3 days of admission as measured, eventually contributing to lesser fluid overload, lesser need for diuretics, pleural tap, Ascitic tap and Dialysis. Thus use of albumin infusion for fluid resuscitation results in lower net fluid balance compared to crystalloids, also smaller infusion volumes may be sufficient for hemodynamic stabilization when albumin solutions are used.

In study by Suchitra et al similar results were noticed with significant reduction in fluid balance in intervention group.

Patients in SAFE study allocated to the albumin group required significantly lower study fluid volumes than those in the saline group, this contributed to significantly higher cumulative fluid balance in the saline group than albumin group during initial ICU days. The following ratios of volume of albumin to the volume of saline required were observed during the first four days 1:1.3 on day 1, 1:1.6 on day 2, 1:1.3 on day 3, 1:1.2 on day 4. The central venous pressure was significantly greater among the patients in albumin group when monitored during initial days of ICU stay.

Need for Positive pressure ventilation was higher in ST only group (71.4%) as compared to ST plus albumin group (57.1%).

Though the difference was not significant between groups.

Need for invasive ventilation was higher in ST only group (28.6%) as compared to ST plus albumin group (11.4%).

Though the difference was not significant between two groups in terms of both invasive and non-invasive positive pressure ventilation. Whereas in similar study by Suchitra Ranjit the difference noticed was significant between two groups, in terms of requirement of positive pressure ventilation (invasive/non-invasive), though other interventions were also practiced.

Thus, albumin infusion would certainly avoid volume overload and its consequences. The use of 25% human albumin solution in the treatment of hypovolemia is recommended when increased fluid volumes appear necessary for circulatory stabilization, especially when patients already show signs of fluid overload. [89]

In standard treatment plus albumin group, 14.2% of patients had major hemorrhage, while incidence was higher in standard treatment only group comprising 42.8% patients having major bleed. Though better

control of shock with early resuscitation lowered the incidence of major bleeding in ST plus group but the difference was not significant between two groups.

In similar comparison study by Suchitra, the incidence of major bleeding was significantly lower in intervention group as compared to control group, signifying the role of other proactive efforts along with albumin infusion in a multipronged approach.

In ST plus albumin group, 17.1% patients, while 31.4% patients in ST only group had AKI. The incidence was lower in ST plus group but the difference was not significant in this study with p value of 0.16.

In the study by Suchitra Ranjit, incidence of AKI was significantly lower in ST plus group (5.3% vs 33%, P=0.04)

Albumin infusion, by better resolution of shock may reduce incidence of AKI. Thus, there is a little evidence to support the role of albumin infusion to preserve renal function. Production of free radicals and increased oxidative stress are shown to mediate AKI in such patients. Therefore, antioxidant properties of albumin may improve outcome. [90]

Final outcome of survival was significantly better in ST plus albumin group as compared to ST only group with the incidence of mortality in intervention group of 2.9% as compared to 20% in control group. (P value =0.04)

Similar benefit of survival was seen in study by Suchitra Ranjit with significantly lower mortality in ST+ group comparative to ST group, among patients with severe dengue. With p value of 0.01.

Mean Duration of PICU stay was longer in ST only group 4.71 days as compared to 4.2 days in ST plus group, this difference was not significant with p value of 0.09.

Results were in accordance with study by Suchitra Ranjit, with the reduced duration of PICU stay in intervention group than control group (3.64 vs 3.95, P=0.79) but again the difference was not significant.

Mean Duration of Hospital stay was longer in ST plus group (8.46 days) as compared to (7.71 days) in ST only group, this difference was not significant with p value of 0.65.

In study by Suchitra Ranjit, with the reduced duration of hospital stay in intervention group than control group (6.0 vs 6.9, P=0.69) but again the difference was not significant.

Our results were equivalent to a recent study published by Ramakrishna mayathari, [91] a cross-sectional study of 80 children with dengue requiring hospital admission. Of these 80 patients, 2 children were admitted directly to PICU as they had hypotension/established critical phase, they were fluid resuscitated, none required Ionotropic support subsequently given albumin infusion. Out of remaining 78 cases, 24 children developed critical phase, they were subsequently transferred to PICU where they were managed and were transfused albumin infusion under diuretic cover. Off these 26 (above cases 2+24) children, 13 required oxygen support, 7 children NPO2, 6 children on Bi-PAP Support, 15 children had abdominal pain with moderate ascites, 7 children had bleed viz petechiae, epistaxis requiring platelet transfusion. Post-transfusion it was noticed that breathing difficulty improved, pain abdomen subsided, oxygen support was tapered early, urine output normalized. As can be seen duration of ICU stay significantly reduced as compared to standard fluid (crystalloid) therapy. None of the children who received albumin transfusion had mortality. Thus, study revealed early recovery, lesser duration of hospital stays, reduced morbidity and mortality with overall improved financial benefit.

Another prospective quasi purposive study conducted in the department of pediatrics at Bangladesh specialized Hospital (BSH). [92] This study was conducted to observe status of albumin, status of platelets, the effects of albumin infusion on treatment outcome as well as the progress of the patients on the basis of the outcome. Albumin was administered to all cases of Dengue fever that was threatening to evolve to severe one as albumin just started to show decline. It was observed that none of the patient admitted thus developed shock or DHF after admission. Also, shock status did not last for more than first 24 hours of hospital admission. Our study thus, concludes that shock can be significantly prevented by judicious administration of 25% albumin in dengue fever in hospital admitted children.

As already proved in literature that quick and adequate plasma volume expansion is a critical life-saving trick among severe dengue shock patients. Further, multiple trials showing positive results with albumin administration as rescue fluid with reasonable explanation are available in severe dengue shock patients, justifying the recommendation.

In short, other crystalloid solutions, when infused in severe dengue shock, get leaked into the extravascular compartment, resulting in tissue edema further precipitating the morbidity. Primary motive to expand the intravascular compartment is not met.

On the other hand, administration of concentrated albumin solutions, raise the intravascular colloid oncotic pressure by increasing the level of plasma proteins, and shift the fluids from interstitial spaces back into the circulation. Thus, albumin not only expand intravascular volume more rapidly and efficiently but also contribute to decrease third space edema.

Along with this, albumin being major constituent of plasma proteins, is a key transporter and most attractive macromolecular carrier[93] due to its availability in pure form and its biodegradability. Primary role of

albumin as free radical scavenger [94] and its role in the maintenance of glycocalyx membrane to reduce vascular leakage are among the superior benefits of albumin as compared to other fluids.

No adverse event was noted associated with albumin infusion in this study, albumin being a natural colloid is much safer than other colloids. This study also has some limitations which should be noted, Firstly, this was single center study. One arm of study was retrospective although age, gender, severity of illness, comorbidities were closely matched. Inclusion criteria was strict with enrollment of only severe dengue cases receiving albumin infusion within 24 hours of hospital admission. Secondly randomization was not done in this interventional study groups.

This study gives enough evidence, attributing the role of albumin infusion to improved outcome in severe dengue patients and justify its use in future large scale research endeavors in critically ill dengue patients.

SUMMARY AND CONCLUSION

- This Retrospective – prospective comparative cohort study was done in Pediatrics department at DMCH, Ludhiana. Patients aged 1 month to 18 years with Severe dengue with hypotension not responding to ≥ 40ml/kg of crystalloid/colloid bolus over 2-3 hours were included in study.

- All enrolled dengue cases were laboratory confirmed either by NS antigen or IgM ELISA.

- In ST plus Albumin group, out of 35 cases enrolled, 15 patients 42.9% had hypotensive shock alone while other 20 patients 57.1% had combination of hypotensive shock with respiratory distress.

- In ST only group, 4 patients (11.4%) had compensated shock, 9 patients (25.7%) had hypotensive shock at admission while 20 patients (57.1%) had combination of respiratory distress along with hypotensive shock and 2 patients (5.7%)had respiratory failure with shock.
  This difference in presentation was not statistically significant at presention with p value 0.202.

- In ST plus albumin cohort, 5 patients (14.3%) had comorbidities. All were obese. While in ST only group 4 patients (11.4%) were obese and 1 (2.9%) had global developmental delay. Both the groups were comparable with respect to comorbidities, with p value of 0.574.

- In ST plus Albumin group patients had Mean PRISM of 13.26$\pm$ 6.55, while ST only group patients had Mean PRISM score of

9.51±5.63.Mean PRISM III sore was higher in ST plus albumin group as compared to ST only group, with p value of 0.003.

- In ST plus Albumin group 30 cases (85.7%) were transferred to PICU for further management while other 5 patients (14.3%) improve following albumin infusion in emergency and shifted to High dependency Unit..While ST only group, 34 cases (97.1%) need to be shifted to PICU following initial management in emergency. Difference was non-significant with p-value of 0.198.

- Mean HCT at admission in ST plus group was 45.9±9.29 while lower 41.75±9.33 in ST only group. Difference was non-significant with p value of 0.098.

- Fall in hematocrit in ST plus Albumin group (-7.82) was significantly more following 24 hours of albumin infusion, as compared to ST only group (-0.68), with p value of 0.001

- At 24 hours of admission, ST plus albumin group had mean positive fluid balance of 20.25±17.05 as compared to 34.98±28.48 in ST only group. Positive Fluid balance was significantly higher in ST only group with p value of 0.037.

- At 48 hours of admission, ST plus albumin group had mean negative fluid balance of -4.98±19.43 as compared to 34.15±109.54 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

- At 72 hours of admission, ST plus albumin group had mean negative fluid balance of -15.74±15.45 as compared to 7.01±32.98 in ST only group. Fluid balance was significantly lower in ST plus Albumin group with p value of 0.001.

- Cumulative fluid balance after 72 hours was negative in ST plus Albumin group of -5.49±36.37 as compared to positive balance of 78.48±134.67 in ST only group. Cumulative Fluid balance was significantly lower in ST plus Albumin group as compared to ST only group with p value of 0.001.

- Thus, Albumin infusion lead to a cumulative negative balance uptil 3 days of admission as measured, eventually contributing to lesser need for diuretics, pleural tap, Ascitic tap and Dialysis.

- During initial resuscitation the total amount of rescue colloid (gel fusion) administered was significantly higher in ST only group (13.6±4.9) as compared to ST plus Albumin group (9.09±2.02). Difference was significant with P value of 0.005.

- Incidence of significant Pleural effusion was significantly higher in ST only group (42.8%) as compared to ST plus Albumin group (14.2%) with P value of 0.001.

- Incidence of significant Ascites was significantly higher in ST only group (68.5%)as compared to ST plus Albumin group (42.8%) with P value of 0.001.

- Need for oxygen support was higher but not significant in ST only group (94.3%) as compared to ST plus group (88.6%) with P value of 0.69.

- Median duration of oxygen requirement (2 days) was similar in ST only group and ST plus group.

- Need for NIV support by prongs was higher but not significant in ST Only group (71.4%) as compared to ST plus group (57.1%) with P value of 0.212.

- Median duration of NIV requirement (2 days) was similar in ST only group and ST plus group.

- Need for ventilator support was higher in ST only group (28.6%) as compared to ST plus Albumin group (11.4%). Difference was near significant with p value of 0.078.

- Total duration of ventilator requirement was higher in ST only group as compared to ST plus group, but the difference was not statistically significant with p value of 0.166.

- Need for inotropic support was significantly higher in ST only group (94.3%) as compared to ST plus group (60%) with p value of 0.001.

- Mean Inotropic score was higher in ST only group (34.07) as compared to ST plus group (18.4), the difference was not significant with p value of 0.431.

- Mean Vasoactive inotropic score was also higher in ST only group (64.9) as compared to ST plus group (30.67), though the difference was not statistically significant with p value of 0.413.

- In ST albumin group, average duration for which inotropes were required was significantly shorter (2.38) as compared to ST only group (3.09), with p value of 0.008.

- Only 1 patient (2.9%) underwent dialysis in ST plus group while 8 patients (22.9%) underwent dialysis in ST only group. Need for dialysis was significantly higher in ST only group with p value of 0.028.

- 10 patients (28.6%) were on diuretic support in ST plus albumin group, while 19 patients (54.3%) needed diuretic support in ST only group. Need for diuretic support was significantly higher in ST only group with p value of 0.029.

- Incidence of bleeding was significantly higher in ST only group (42.9%) as compared to ST plus group (14.3%) with P value 0.008.

- The final outcome of survival was significantly better in ST plus Albumin group (97.1%) as compared to ST only group (77.1%) (P=0.043).

CONCLUSION

This retrospective – prospective comparative cohort study was conducted among severe dengue patients with hypotension not responding to $\geq$ 40ml/kg of crystalloid/ colloid bolus over 2-3 hours. The use of albumin infusion was associated with significantly improved outcomes in severe dengue patients with shock.

As Children with severe dengue with refractory shock are at extremely high risk of mortality. This study showed that iv-albumin infusion in addition to standard treatment may significantly reduce mortality with 20% survival benefit among those who received albumin.

In addition, study concludes that, administration of IV albumin for persistent shock results in effective plasma volume expansion with better resolution of shock, thus reduced need and duration of inotropes along with lesser incidence of AKI and significant bleeding, among those who received albumin.

Also, Severe dengue patients in shock, if suitably supplemented with IV albumin, it decreases the need of rescue colloid boluses along with the lowering of net fluid balance which eventually contributes to lesser need for diuretics and dialysis, in those receiving albumin infusion as compared to those who were treated solely as per WHO recommendations.

IV albumin was well tolerated, no adverse event was noted following transfusion in our study. Also, albumin is a safe blood derivative from point of view of transmission of infections.

In conclusion, most children with severe dengue with shock responded well to judicious treatment with 25% albumin infusion. Resuscitation regimen of albumin infusion at 0.5-1g/Kg over 4 hours in persistent shock following initial resuscitation with crystalloid/ colloid bolus is strongly supported by our study and should be recommended for children with severe dengue with shock.

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S/. No	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
1	YES	K K	8	FEMALE	1397549	14-10-2022	22.7	126	14.3	3	3	1			3	FEBRILE	OPEN & STABLE	32	INCREASED	NORMAL	NONE	99		121	3	80	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	128
2	YES	P	12	FEMALE	1373025	4/9/2022	40	148	18.3	4	2	2			4	FEBRILE	OPEN & STABLE	34	INCREASED	NORMAL	BASAL CREPTS	88	94	134	5	78	64	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	96
3	YES	A T	13	MALE	1195916	23/10/2021	35	153	14.9	7		2	2		7	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	94		87	4	72	36	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	102
4	YES	S D	13	FEMALE	1205468	10/11/2021	45	128	30.3	5	2	2	2		5	FEBRILE	OPEN & STABLE	54	INCREASED	DIFFERENTIAL	BASAL CREPTS	87	96	136	4	90	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	140
5	YES	D N	11	MALE	1206792	13/11/2021	65	162	24.8	4	1	1			4	FEBRILE	OPEN & STABLE	26	NORMAL	REDUCED AT BASES	NO ADDED SOUNDS	99		138	4	UR	UR	POOR	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	86
6	YES	A J	10	FEMALE	1197572	26/10/2021	46	148	21	6		2			6	FEBRILE	OPEN & STABLE	36	INCREASED	DIFFERENTIAL	BASAL CREPTS	76	97	96	3	84	62	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	72
7	YES	A	8	FEMALE	1194395	20/10/2021	28	124	18.3	5	2	2			5	FEBRILE	OPEN & STABLE	28	NORMAL	NORMAL	NONE	96		160	5	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	82
8	YES	Y S	11	MALE	1195251	21/10/2021	55	153	23.5	3	1	1	1		3	FEBRILE	OPEN & STABLE	42	INCREASED	POOR	REDUCED AIR ENTRY AT BASAL AREA	90	98	129	4	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	54
9	YES	S M	11	MALE	1187223	7/10/2021	55	165	20.2	5	1	1			5	FEBRILE	OPEN & STABLE	48	INCREASED	NORMAL	NONE	92	99	150	4	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	65
10	YES	G	13	MALE	1204209	9/11/2021	43	152	18.5	6	1				6	AFEBRILE	OPEN & STABLE	28	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	96		138	4	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	109
11	YES	M K	15	FEMALE	1208876	16/11/2021	45	152	19.5	2		2			2	FEBRILE	OPEN & STABLE	22	NORMAL	NORMAL	NONE	98		122	3	60	40	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	86

S/. No.	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
12	YES	H	9	MALE	1206721	12/11/2021	21	122	14.1	6	2	1			6	AFEBRILE	OPEN & STABLE	36	INCREASED	DIFFERENTIAL	BASAL CREPTS	90	98	140	3	86	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	67
13	YES	S B	15	MALE	1205478	11/11/2021	40	160	15.6	4		2	2	BLOOD IN VOMITING	4	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	89	94	138	3	86	68	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	46
14	YES	P G	14	MALE	1184308	3/10/2021	50	160	19.5	5	3	3			5	AFEBRILE	OPEN & STABLE	48	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	87	99	160	5	50	30	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	57
15	YES	L S	5	MALE	1198647	28/10/2021	13.5	101	13.5	5	3	2		BLOOD IN VOMITING	5	AFEBRILE	OPEN & STABLE	46	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	94	97	128	3	78	46	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	64
16	YES	R	14	MALE	1226970	20/12/2022	53	171	18.1	4		3			4	FEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	99	112	5	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	166
17	YES	J	7	MALE	1406252	31/10/2022	20.8	130	12.3	5	3				5	FEBRILE	OPEN & STABLE	40	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	90	98	112	4	70	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	126
18	YES	T	7	MALE	1418547	21/11/2022	19	114	14.6	4		2			4	FEBRILE	OPEN & STABLE	42	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	92	100	138	4	70	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	181
19	YES	H	15	MALE	1417009	18/11/2022	69	166	26.9	5	4	4			5	FEBRILE	OPEN & UNSTABLE			DIFFERENTIAL	BASAL CREPTS		95	146	5	40	UR	GOOD	POOR	COOL	SINUS	1	T	5	1.5	BRISK	NORMAL & SYMMETRICAL	92
20	YES	M	6	MALE	1417616	19/08/2022	22.4	128	13.9	4	3	2	2		4	AFEBRILE	OPEN & STABLE	42	NORMAL	NORMAL	NONE	94	98	132	3	56	30	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	54
21	YES	S	11	MALE	26571	19/10/2022	21	136	11.35	4	2	2			4	FEBRILE	OPEN & STABLE	23	INCREASED	DIFFERENTIAL	BASAL CREPTS	98	96	126	5	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	79

S/. No	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
22	YES	D	13	FEMALE	1578780	27/08/2023	35	149	15.7	5	1				5	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	100	98	102	4	80	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	94
23	YES	H	14	FEMALE	1569769	11/8/2023	44	154	18.5	10	4	1			10	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	96	102	3	90	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	120
24	YES	P	10	FEMALE	1599286	29/9/2023	41	146	20.8	4	2	2			4	AFEBRILE	OPEN & STABLE	24	NORMAL	DIFFERENTIAL	BASAL CREPTS	92	98	118	3	90	68	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	147
25	YES	A B	11	MALE	1594959	23/9/2023	66	153	24.4	3	1			ALTERED BEHAVIOUR	5	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	90	98	132	4	88	64	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	118
26	YES	S	4	FEMALE	1592305	18/09/2023	15	105	12.8	15	4				15	AFEBRILE	OPEN & STABLE	40	NORMAL	NORMAL	NONE	96	99	110	3	90	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	74
27	YES	H M	12	MALE	1615287	28/10/2023	35	150	15	2	1	1		BODY ACHES	5	AFEBRILE	OPEN & STABLE	24	NORMAL	DIFFERENTIAL	BASAL CREPTS	96	98	104	4	80	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	106
28	YES	R A	5	FEMALE	1611997	22/10/2023	15	110	12.39	2	2	1			6	AFEBRILE	OPEN & STABLE	44	INCREASED	NORMAL	NONE	94	98	168	4	40	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	90
29	YES	A G	10	FEMALE	1610366	18/10/2023	57	149	25.7	4	1	4		BLEEDING FROM NOSE	4	AFEBRILE	OPEN & STABLE	24	NORMAL	NORMAL	NONE	98		114	3	88	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	86
30	YES	A V	13	MALE	1616633	31/10/2023	68.5	158	27.4	3	1	1		BODY ACHES	3	FEBRILE	OPEN & STABLE	25	NORMAL	NORMAL	NONE	96		110	3	90	56	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	106

S/. No	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
31	YES	S S	13	MALE	1630684	29/11/2023	81	166	29.3	2	1	1		BODY ACHES	2	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	94	98	120	3	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	180
32	YES	G J	12	MALE	1628850	24/11/2023	70	154	29.5	3	1				3	AFEBRILE	OPEN & STABLE	24	NORMAL	NORMAL	NONE	94		110	3	88	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	124
33	YES	P	9	FEMALE	1606482	12/10/2023	25	136	13.5	3	2	2			3	FEBRILE	OPEN & STABLE	24	NORMAL	NORMAL	NONE	96		109	3	60	40	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	89
34	YES	R S	13	MALE	1618455	4/11/2023	71.4	167.5	25	3	2	2			4	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	97		160	4	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	153
35	YES	T	15	MALE	1626443	21/11/2023	58	176.5	18.6	6	4	2			6	AFEBRILE	OPEN & STABLE	22	NORMAL	NORMAL	NONE	96		106	2	80	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	102
36	NO	S	1	MALE	1198636	28/10/2021	8	72		3		1	1		4	AFEBRILE	OPEN & STABLE	28	INCREASED	DIFFERENTIAL	BASAL CREPTS	90		84	4	90	74	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	132
37	NO	R M	12	MALE	1214527	26/11/2021	45	158.5	24.84	4	1	1			4	AFEBRILE	OPEN & STABLE	24	NORMAL	NORMAL	NONE	97		116	3	50	24	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	127
38	NO	A	12	MALE	1192630	13/9/2021	40	152	16.01	4	1	1			4	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	97	142	4	89	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	146
39	NO	K	13	MALE	1159869	24/8/2021	36	156	14.8	4	4	1			4	FEBRILE	OPEN & STABLE	36	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	98	110	4	9	62	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	88
40	NO	S	6	FEMALE	1169268	7/9/2021	25	114	19.3	4	1	1			4	AFEBRILE	OPEN & STABLE	32	INCREASED	DIFFERENTIAL	BASAL CREPTS	88	99	112	4	64	30	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	108
41	NO	H P	7	MALE	1375664	8/9/2022	40	128	24.8	3	3			PETECHIE OVER BODY	3	FEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	90	98	112	4	70	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	86
42	NO	A J	5	FEMALE	1417574	19/11/2022	18	110	14.9	5	5	1		REDUCED URINE OUTPUT	5	AFEBRILE	OPEN & STABLE	32	NORMAL	NORMAL	NONE	95		126	3	52	44	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	54
43	NO	D	15	MALE	290614	16/11/2022	69	158	27.6	4	1	1			4	FEBRILE	OPEN & STABLE	22	NORMAL	NORMAL	NONE	96		104	4	100	70	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	109

Sr. No	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
44	NO	V B	13	MALE	116976	3/11/2022	37	158	14.8	7		3			7	FEBRILE	OPEN & STABLE	24	NORMAL	NORMAL	NONE	95		112	4	90	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	126
45	NO	N K	9	FEMALE	1196674	24/10/2021	20	130	11.8	4		2		ALTERED SENSORIUM	4	FEBRILE	OPEN & STABLE	36	INCREASED	POOR	NONE	90	99	130	3	100	68	GOOD	GOOD	WARM	SINUS	3	3	5	2	BRISK	NORMAL & SYMMETRICAL	135
46	NO	A	11	MALE	1433103	16/12/2022	50	150	33.3	3	3	3		ALTERED SENSORIUM	3	FEBRILE	OPEN & STABLE	58	INCREASED	DIFFERENTIAL	BASAL CREPTS	88	100	148	4	70	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	116
47	NO	S	14	MALE	1204211	9/11/2021	27	147	12.54	6	1	1	1	BLOOD IN VOMITING & BLEEDING FROM NOSE	7	AFEBRILE	OPEN & STABLE	28	NORMAL	NORMAL	NONE	98		56	2	86	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	84
48	NO	K P	15	MALE	1416976	18/11/2022	55	174	18.2	5				INCREASED RATES OF BREATHING	5	FEBRILE	OPEN & STABLE	30	INCREASED	DIFFERENTIAL	BASAL CREPTS	91	97	112	3	100	80	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	114
49	NO	S	8	MALE	1190247	12/10/2021	43	142	21.33	4	1				4	FEBRILE	OPEN & STABLE	40	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	90	97	115	4	70	42	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	120
50	NO	D B	10	FEMALE	1183272	30/09/2021	32	150	13.8	4		2		HEADACHE	4	FEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	94	97	160	4	80	56	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	96
51	NO	A T	13	MALE	1195916	23/10/2021	35	153	14.9	7		3	2	DECREASED URINE OUTPUT	7	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	NONE	94	97	96	4	70	30	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	110
52	NO	D	10	MALE	1208351	15/11/2021	50	154	20.8	5	2	2	1	ALTERED SENSORIUM	5	AFEBRILE	OPEN & UNSTABLE			DIFFERENTIAL	BASAL CREPTS		94	140	5	46	38	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	122
53	NO	H	14	MALE	1188717	9/10/2021	62	165	22.79	6	2			BODYACHES	6	FEBRILE	OPEN & STABLE	52	INCREASED	DIFFERENTIAL	BASAL CREPTS	90	98	150	5	40	26	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	100

Sr. No	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
54	NO	S	4	MALE	1409691	28/10/2022	16.5	116	12.8	3		1			3	FEBRILE	OPEN & STABLE	36	NORMAL	NORMAL	NONE	97	100	148	3	66	32	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	88
55	NO	J	6	MALE	1154188	14/8/2021	17	119	13.6	4	2			PETECHIE OVER BODY	4	FEBRILE	OPEN & STABLE	34	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	97	128	3	60	40	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	144
56	NO	M S	10	MALE	1193458	18/10/2021	48	146.8	22.5	5	2	2			5	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	92	98	88	4	85	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	100
57	NO	L J	14	FEMALE	1575981	22/08/2023	64	154	26.99	2	1	1			5	AFEBRILE	OPEN & STABLE	52	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	94	98	134	4	106	78	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	103
58	NO	T	7	MALE	1578100	25/8/2023	26	120	18	4	3	1			4	FEBRILE	OPEN & STABLE	28	INCREASED	DIFFERENTIAL	REDUCED AIR ENTRY AT BASAL AREA	92	98	112	3	78	52	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	83
59	NO	J K	16	MALE	1569784	11/8/2023	45	172	15.3	5	2	1			5	FEBRILE	OPEN & STABLE	30	INCREASED	DIFFERENTIAL	BASAL CREPTS	93	97	113	4	90	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	79
60	NO	S	16	FEMALE	1578780	27/08/2023	50	145.5	23.6	5	1				5	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	BASAL CREPTS	90	98	98	3	92	74	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	104
61	NO	S K	13	FEMALE	1605147	10/10/2023	40	121	27.3	3	1	2			3	AFEBRILE	OPEN & STABLE	40	INCREASED	DIFFERENTIAL	BASAL CREPTS	94	96	144	3	58	48	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	84
62	NO	A J	12	MALE	1618970	4/11/2023	50	174	15.2	3		1		ABNORMAL BODY MOVEMENTS	3	FEBRILE	OPEN & UNSTABLE			DIFFERENTIAL	BASAL CREPTS		96	132	3	88	50	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	110

Sr. No.	ALBUMIN (YES/NO)	NAME	AGE (YEARS)	SEX	MRD NO.	DOA	WT (KG)	HEIGHT	BMI	FEVER (DAYS)	PAIN ABDOMEN(DAYS)	VOMITING (DAYS)	BLACK STOOLS(DAYS)	OTHERS	DURATION OF ILLNESS (DAYS)	PHASE	AIRWAY	RR	EFFORTS	AIR ENTRY	AUSCULTATION	SPO2 (ON ROOM AIR)	SPO2 (ON OXYGEN)	HR	CFT (SECONDS)	SBP	DBP	CENTRAL PULSES	PERIPHERAL PULSES	SKIN	ECG	E	V	M	Pupil size	REACTION	MOTOR ACTIVITY	RBS
63	NO	S K	14	FEMALE	1589307	13/9/2023	35	153	14.9	7	7				7	AFEBRILE	OPEN & STABLE	36	INCREASED	NORMAL	NONE	96		138	4	70	36	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	134
64	NO	M S	10	MALE	1605758	10/10/2023	38.1	143.5	18.6	3	3	1			5	AFEBRILE	OPEN & STABLE	23	NORMAL	NORMAL	NONE	96		102	4	94	56	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	97
65	NO	N	3	FEMALE	1608606	15/10/2023	13	93	11.4	5	1	2		LETHARGY	10	AFEBRILE	OPEN & STABLE	38	INCREASED	DIFFERENTIAL	NONE	90	97	154	3	80	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	88
66	NO	D K	12	FEMALE	1615486	30/10/2023	40	152	17.3	3		1		COUGH	5	AFEBRILE	OPEN & STABLE	48	INCREASED	DIFFERENTIAL	BASAL CREPTS		84	150	2	92	54	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	160
67	NO	G V	9	MALE	45773	15/11/2023	43	135	23.6	3	1	3			5	AFEBRILE	OPEN & STABLE	46	INCREASED	DIFFERENTIAL	BASAL CREPTS	UR	80	125	4	UR	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	107
68	NO	G S	9	MALE	1020295	4/11/2023	35	139.5	19.4	2	1	1			3	AFEBRILE	OPEN & STABLE	30	NORMAL	NORMAL	NONE	98		102	3	70	UR	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	102
69	NO	A R	1	FEMALE	1625102	17/11/2023	9.6	69	11.2	3				POOR ORAL INTAKE	3	AFEBRILE	OPEN & STABLE	60	INCREASED	NORMAL	NONE	98		172	4	88	56	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	116
70	NO	R K	7	FEMALE	1587078	10/9/2023	24	121	16.4	3	2	1		BLOOD IN VOMITING	4	AFEBRILE	OPEN & STABLE	26	NORMAL	NORMAL	BASAL CREPTS	90	100	150	3	101	60	GOOD	POOR	COOL	SINUS	4	5	6	2	BRISK	NORMAL & SYMMETRICAL	96

Sr. No.	TEMP.	OTHERS	ADMISSION DIAGNOSIS	RESP	CVS		GIT	CNS		FINAL DIAGNOSIS	IgM ELISA	NS1 Ag	SHOCK (Y/N)	FLUID ACCUMULATION WITH RESPIRATORY DISTRESS (Y/N)	SEVERE BLEEDING (Y/N)	SITE OF BLEED	AST/ALT>1000 (Y/N)	IMPAIRED CONCIOUSNESS (Y/N)	CARDIAC DYSFUNCTION (Y/N)	EVIDENCE OF FLUID OVERLOAD (Y/N)	RENAL DYSFUNCTION (Y/N)	NEED FOR DIALYSIS(Y/N)	SUPERADDED INFECTION (Y/N)	COMORBIDITIES	NEED FOR PICU ADMISSION	PRISM	HCT (AT ADMISSION)	HCT (AFTER 24 HOURS)	FALL IN HCT	HB (D1)	HB(D2)	HB(D3)	HB(D4)	TLC(D1)	TLC(D2)	TLC(D3)	TLC(D4)	PLT(D1)
1	102	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	SUBCOASTAL RETRACTIONS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	NEGATIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	54.5	34.1	-20.4	17.4	12.8	12.7	9.7	7.8	28.86	25.17	7.67	52
2	101	ERYTHEMATOUS HUE	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	BASAL CREPTS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	9	58.9	40.3	-18.6	18	12.3	12.4	10.4	8.8	11	6.2	4	79
3	97		HYPOTENSIVE SHOCK		PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	Y	GIT	N	N	N	Y	N	N	N	NO	YES	18	47.3	37.2	-10.1	15.7	12.7	10.7	10.4	6.4	6.9	8.1	9.7	54
4	103.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	BASAL CREPTS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	N	N	Y	N	N	N	NO	YES	19	38.9	31	-7.3	13.2	11.1	10.4	9.6	1.7	7.4	4.6	6.7	70
5	102.4	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS WITH OBESITY	NEGATIVE	POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	OBESITY	YES	16	46.5	37.3	-9.2	15.9	13.1	12.7	11.1	9.6	14.6	15.2	14.1	72.6
6	101.8	PALLOR	HYPOTENSIVE SHOCK	BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	NEGATIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	9	52.6	41.4	-11.2	16.9	13.8	13.1	11.7	4.3	3.3	8	6.5	61.2
7	104.3	ERYTHEMATOUS HUE	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	8	40.8	28.3	-12.5	14.1	9.5	10.1	10.2	6	5.8	7.1	7.8	45
8	103.8		HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	4	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH GLOBAL LEFT VENTRICULAR HYPOKINESIA WITH SEIZURES	POSITIVE	POSITIVE	Y	Y	N		Y	N	Y	Y	N	N	N	OBESITY	YES	20	49.1	46.9	-2.2	16.7	15.7	14.8	12.9	5.1	13.7	8.6	7.5	50.3
9	100.8	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH ENCEPHALOPATHY WITH RESPIRATORY FAILURE WITH	POSITIVE	POSITIVE	Y	Y	N		Y	Y	N	Y	Y	N	Y	NO	YES	23	56.9	46.2	-10.7	17.8	15.3	14.6	12.7	10.2	14.7	16	13	60.1
10	97.8	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH HEPATITIS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	NO	YES	8	34.5	29.7	-4.8	11.5	10.7	9.1	9	5.3	8.7	6.8	2.8	48
11	102.6	ERYTHEMATOUS HUE	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	N	N		N	N	N	N	N	N	N	NO	NO	6	41.9	30.2	-11.7	14.1	10.1	10.9	9.8	5.7	3.6	7.5	5.4	72.9

Sr. No.	TEMP.	OTHERS	ADMISSION DIAGNOSIS	RESP	CVS		GIT	CNS		FINAL DIAGNOSIS	IgM ELISA	NS1 Ag	SHOCK (Y/N)	FLUID ACCUMULATION WITH RESPIRATORY DISTRESS (Y/N)	SEVERE BLEEDING (Y/N)	SITE OF BLEED	AST/ALT>1000 (Y/N)	IMPAIRED CONCIOUSNESS (Y/N)	CARDIAC DYSFUNCTION (Y/N)	EVIDENCE OF FLUID OVERLOAD (Y/N)	RENAL DYSFUNCTION (Y/N)	NEED FOR DIALYSIS(Y/N)	SUPERADDED INFECTION (Y/N)	COMORBIDITIES	NEED FOR PICU ADMISSION	PRISM	HCT (AT ADMISSION)	HCT (AFTER 24 HOURS)	FALL IN HCT	HB (1D1)	HB(D2)	HB(D3)	HB(D4)	TLC(D1)	TLC(D2)	TLC(D3)	TLC(D4)	PLT(D1)
12	99.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	NEGATIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	NO	6	43.5	34.7	-8.8	15	12	12.1		5.7	2.6	4.4		36.6
13	98.3		HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE WITH GI BLEED	NEGATIVE	POSITIVE	Y	Y	Y	GIT	N	Y	N	Y	N	N	N	NO	YES	24	32.3	30	-2.3	10.8	10	10.7	9.9	7.8	6.7	7	6.1	56.5
14	96.8	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	NO	YES	9	42.2	36.4	-5.8	12.9	11.2	10.7	10.6	11.4	6.02	8	8.3	69.6
15	97	RASH	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH GI BLEED	POSITIVE		Y	Y	Y	GIT	N	N	N	Y	N	N	N	NO	YES	14	44.7	33.3	-11.4	15	11.6	11	11.2	14.8	14.4	9.3	6.2	52.9
16	103.2		HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH AKI	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	Y	N	N	NO	YES	24	47	38.5	-11.5	16.1	13.6	12.1	9.2	10.4	6.6	7.3	7.2	65
17	101	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	9	49.3	36	-13.3	16.4	11.6	11.1	10.6	9.38	5.8	55	3.6	55.4
18	100.6		HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH POLYSEROSITIS WITH RESPIRATORY DISTRESS WITH HEPATITIS WITH AKI	POSITIVE	POSITIVE	Y	Y	N		Y	N	Y	Y	Y	N	N	NO	YES	23	39.7	30.7	-9	12.7	11.9	9.9	10	12.2	10.7	13	13.7	72.2
19	99.6	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	3	6	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH ENCEPHALOPATHY WITH RESPIRATORY FAILURE WITH HEPATITIS WITH AKI WITH VAP	POSITIVE	POSITIVE	Y	Y	N		Y	Y	Y	Y	Y	N	Y	OBESITY	YES	30	53	34.5	-18.5	15.4	10.2	8.2	7.7	11	9.2	8.7	6.3	61
20	97.9	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	N	N		N	N	N	N	N	N	N	NO	YES	9	58.4	48.6	-9.8	16.8	14.7	12.4	12.3	4.6	6.4	6.6	7	48
21	104.3	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	8	32.8	30.2	-2.6	10.3	10	7.8	8	9.3	9.6	11.22	7.5	60.5

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22	98.2	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH BILATERAL PLEURAL EFFUSION WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	8	28.9	24	-4.9	8.2	8.2	7.8	7.9	21.9	17.4	10.85	4.85	40
23	97.6	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	Y	N	N	NO	YES	10	36.6	27	-9.6	11.5	8.9	12.6	9.9	8.8	5.2	7.11	5.8	42
24	99.2	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	55.6	46.8	-8.8	18	15.6	12.6	11.9	8.34	11.82	6.65	8.7	44.9
25	98.5	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE WITH POLYSEROSITIS WITH AKI WITH COAGULOPATHY WITH DIFFUSE CEREBRAL EDEMA	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	Y	N	Y	Y	Y	Y	NO	YES	10	51.5	26.8	24.7	15.9	8.3	8.7	10.4	15.3	8.3	14.4	9	63.5
26	99.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH BILATERAL PLEURAL EFFUSION	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	12	28.8	28.1	0.7	9.4	9	8.6	8.5	6.26	11.21	11.14	13.96	37.1
27	97.8	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS	POSITIVE	POSITIVE	Y	N	N		Y	N	N	N	N	N	N	NO	YES	14	50.3	39.3	-11	16.3	13.1	12.2	12	14.8	10.3	18.8	8.39	59.7
28	96.5	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS WITH POLYSEROSITIS	POSITIVE	POSITIVE	Y	Y	N		Y	N	Y	N	N	N	N	NO	YES	21	39.4	23.7	-15.7	13.3	7.7	8.1	6.9	14.11	12.2	20.8	12	47
29	98.2	NORMAL	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	N	N	N	N	OBESITY	NO	18	45	38.5	-6.5	14.8	13	11.1	10	8.46	8.49	7.6	5.6	57
30	98.7	NORMAL	HYPOTENSIVE SHOCK	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	NO	8	41.2	38	3.1	12.3	11	11.2	10.9	7.62	11	18.3	21.4	38.7

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31	99	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS WITH AKI	POSITIVE		Y	Y	N		Y	N	N	Y	Y	N	N	NO	NO	8	71.2	55.6	-19.6	22	17.1	16.4	16	10.5	6.39	8.6	7.3	707
32	98.2	NORMAL	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH AKI		POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	OBESITY	YES	16	50.7	42.5	-8.2	15.8	15.1	13.3	12.7	4.48	10.7	12.7	14.9	77.5
33	102	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	N	N		N	N	N	N	N	N	N	NO	YES	18	47.3	44.7	2.6	14.9	14.8	15.7	13.1	7.2	7.98	13.41	10	58.7
34	99	PALLOR	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	8	55	42.6	-12.4	18.9	13.6	11.6	12.1	9.32	8.97	8.35	8.7	59
35	99.6	NORMAL	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE	5	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH TRANSAMINITIS	POSITIVE	POSITIVE	Y	N	N		Y	N	N	N	N	N	N	NO	YES	9	40.1	36.6	3.5	12.9	12.2	12.7	13.7	11.3	17.46	10.1	10.42	78.2
36	99.2	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	Y	N	Y	Y	N	N	NO	YES	14	19.2	30.1	10.9	6.3	10.2	9.9	9.2	15.4	16.3	16.3	11.2	40
37	97.6	NORMAL	HYPOTENSIVE SHOCK	B/L AIR ENTRY PRESENT WITH NO ADDED SOUNDS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	45.9	49.9	4	15.4	16.7	16.1	13.1	4	8.8	15.2	7.2	40.7
38	98.4	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	7	46.5	47.8	1.3	15.6	15.6	12.6	11.4	4.4	7.2	5.2	7.1	51.7
39	103.3	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	5	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	NO	YES	7	43.4	41	-2.4	14.2	13.2	14.5	12.4	21.4	10.5	12.5	6	25
40	96.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	NEGATIVE	POSITIVE	Y	Y	Y	SKIN	N	N	N	Y	N	N	N	NO	YES	9	43	35.3	-7.7	13.1	11	12.8	11.5	9.3	7.5	8.1	6.8	43.8
41	101.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	2.5	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	NEGATIVE	POSITIVE	Y	Y	N		Y	Y	N	Y	N	N	N	NO	YES	7	46.4	48	1.6	12.5	11.7	10.8	11.5	12.9	7.3	6	13.2	84.9
42	97	PALLOR	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	42.1	35	-7.1	13.7	11.4	10.5	9.9	11.34	19.5	20.8	16.2	40
43	100.7	PALLOR	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	OBESITY	YES	6	40.5	43.4	3.4	13	13.6	11.4	10.9	2.37	3.1	4.3	5.5	68.4

Sr. No.	TEMP.	OTHERS	ADMISSION DIAGNOSIS	RESP	CVS		GIT	CNS		FINAL DIAGNOSIS	IgM ELISA	NS1 Ag	SHOCK (Y/N)	FLUID ACCUMULATION WITH RESPIRATORY DISTRESS (Y/N)	SEVERE BLEEDING (Y/N)	SITE OF BLEED	AST/ALT>1000 (Y/N)	IMPAIRED CONCIOUSNESS (Y/N)	CARDIAC DYSFUNCTION (Y/N)	EVIDENCE OF FLUID OVERLOAD (Y/N)	RENAL DYSFUNCTION (Y/N)	NEED FOR DIALYSIS(Y/N)	SUPERADDED INFECTION (Y/N)	COMORBIDITIES	NEED FOR PICU ADMISSION	PRISM	HCT (AT ADMISSION)	HCT (AFTER 24 HOURS)	FALL IN HCT	HB (1D1)	HB(D2)	HB(D3)	HB(D4)	TLC(D1)	TLC(D2)	TLC(D3)	TLC(D4)	PLT(D1)
44	100.7	PALLOR	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	Y	ORAL CAVITY &GIT	N	N	N	Y	N	N	N	NO	YES	6	38.6	35.1	3.5	12.2	10.8	9.6	11.3	15.82	21.5	13.2	16.64	79.8
45	102.85	PALLOR	RESPIRATORY DISTRESS WITH ALTERED SENSORIUM	B/L AIR ENTRY REDUCED	PALPABLE	NOT PALPABLE	3	11	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRAT	POSITIVE	POSITIVE	Y	Y	Y	PULMONARY & GIT	Y	Y	N	Y	Y	Y	Y	NO	YES	16	23.6	34	10.4	7.9	11.2	10.6	9.5	16.4	18.9	16.7	18.5	88.2
46	103.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH ALTERED SENSORIUM	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRATORY	POSITIVE	POSITIVE	Y	Y	Y	PULMONARY & GIT	Y	Y	N	Y	Y	Y	N	NO	YES	24	36.5	34.9	1.6	11.8	11.3			21.7	22.4			60
47	99	PALLOR	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	Y	NASAL & GIT	N	N	N	Y	N	N	N	NO	NO	4	29.8	29.7	-0.1	10.1	10	11.4	11.2	12.1	10	10.5	6.4	75.4
48	101.6	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	55.2	48.2	-7	17.1	14.8	15.7	15.6	6.6	6	4.7	5.2	41.9
49	100.4	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH AKI WITH HEPATITIS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	Y	N	N	NO	YES	9	38.9	33.9	-5	12.4	11.4	11.9	11.7	14.9	16.9	11.1	7.8	58.3
50	101.2	PALLOR	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE WITH ACUTE LIVER FAILURE WITH ACUTE KIDNEY INJURY WITH COAGULOPATHY		POSITIVE	Y	Y	Y	ORAL CAVITY &GIT	Y	Y	Y	Y	Y	Y	N	NO	YES	9	50.7	50.6	-0.1	15.5	15.8	13.2	13.7	10	14.8	35.1	17.2	50
51	98.8	NORMAL	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS		POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	8	51.6	37.2	14.4	17.1	12.7	10.3	10.7	7.8	6.9	6.3	8.1	45
52	97.9	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	4	2	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRAT	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	Y	N	Y	Y	Y	N	OBESITY	YES	26	31.6	29	2.6	10.7	10.1	9.6		27.1	30.7	28		62.7
53	99	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS WITH GI BLEED	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	N	N	Y	Y	Y	N	NO	YES	10	56.7	36.2	-20.5	19.3	12.3	12.1	11.4	26.3	17.9	17.5	10.5	62.1

Sr. No.	TEMP.	OTHERS	ADMISSION DIAGNOSIS	RESP	CVS		GIT	CNS		FINAL DIAGNOSIS	IgM ELISA	NS1 Ag	SHOCK (Y/N)	FLUID ACCUMULATION WITH RESPIRATORY DISTRESS (Y/N)	SEVERE BLEEDING (Y/N)	SITE OF BLEED	AST/ALT>1000 (Y/N)	IMPAIRED CONCIOUSNESS (Y/N)	CARDIAC DYSFUNCTION (Y/N)	EVIDENCE OF FLUID OVERLOAD (Y/N)	RENAL DYSFUNCTION (Y/N)	NEED FOR DIALYSIS(Y/N)	SUPERADDED INFECTION (Y/N)	COMORBIDITIES	NEED FOR PICU ADMISSION	PRISM	HCT (AT ADMISSION)	HCT (AFTER 24 HOURS)	FALL IN HCT	HB (D1)	HB(D2)	HB(D3)	HB(D4)	TLC(D1)	TLC(D2)	TLC(D3)	TLC(D4)	TLC(D5)
54	100.2	NORMAL	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	Y	N	N	NO	YES	8	46.2	44	2.2	13.9	14	10.9	10.6	7.7	11.5	8.9	7.27	52.8
55	102	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE WITH AKI WITH CARDIOPULMONARY ARREST		POSITIVE	Y	Y	N		N	Y	N	Y	Y	Y	N	N	NO	YES	12	35.4	26.5	8.9	12.4	8.9	11	10.9	4	3.6	5.3	4.5	88.4
56	98.1	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE		Y	Y			N	N	N	N	N	N	N	OBESITY	YES	6	53.9	44.3	-9.6	18.2	14.6	12.5	11.1	5.9	7.6	4.9	5.6	54.1
57	98	PALLOR	COMPENSATED SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	N	N	N	N	OBESITY	YES	4	57.3	45.4	-11.9	18.7	15.4	12.4	11.7	7.96	9.12	11.31	9.79	60.1
58	99	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE		Y	Y	N		N	N	N	N	N	N	N	NO	YES	6	38.6	37	-1.6	14.2	11.6	8.6	10.4	17.4	22	14.4	18.4	66.4
59	102	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE WITH ACUTE LIVER FAILURE WITH ACUTE KIDNEY INJURY WITH COAGULOPATHY	POSITIVE	POSITIVE	Y	Y	Y	SKIN	Y	Y	N	Y	Y	Y	Y	NO	YES	14	36.8	30.3	-6.5	11.4	7.1	7.8		6.37	39.3	51.73		76
60	99	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	N	N		N	N	N	Y	N	N	N	NO	YES	6	48.3	46	-2.3	15.8	15	12.6	11.9	2.2	5.8	5.8	3.5	53.4
61	98.4	NORMAL	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH TRANSAMINITIS		POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	GDD	YES	9	40.1	37.4	-2.7	12.3	11.8	7.4	6.7	29.7	22.2	22.3	13.3	51.2
62	101	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY FAILURE	B/L BASAL CREPTS	PALPABLE	NOT PALPABLE		5	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	Y	N	Y	Y	N	N	NO	YES	12	42	41.1	-0.9	13	12.3	12.6	11.9	4.72	14.5	11.2	5.2	79

Sr. No.	TEMP.	OTHERS	ADMISSION DIAGNOSIS	RESP	CVS		GIT	CNS		FINAL DIAGNOSIS	IgM ELISA	NS1 Ag	SHOCK (Y/N)	FLUID ACCUMULATION WITH RESPIRATORY DISTRESS (Y/N)	SEVERE BLEEDING (Y/N)	SITE OF BLEED	AST/ALT>1000 (Y/N)	IMPAIRED CONCIOUSNESS (Y/N)	CARDIAC DYSFUNCTION (Y/N)	EVIDENCE OF FLUID OVERLOAD (Y/N)	RENAL DYSFUNCTION (Y/N)	NEED FOR DIALYSIS(Y/N)	SUPERADDED INFECTION (Y/N)	COMORBIDITIES	NEED FOR PICU ADMISSION	PRISM	HCT (AT ADMISSION)	HCT (AFTER 24 HOURS)	FALL IN HCT	HB (D1)	HB(D2)	HB(D3)	HB(D4)	TLC(D1)	TLC(D2)	TLC(D3)	TLC(D4)	PLT(D1)
63	99	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS WITH MYOCARDI	POSITIVE	POSITIVE	Y	Y	N		N	N	Y	Y	N	N	N	NO	YES	6	31.4	34.2	2.8	7.3	10.5	8.2	7.2	2.53	7.63	6.63	5.59	60.3
64	97.7	PALLOR	COMPENSATED SHOCK	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	N	N	N	N	NO	YES	4	41.9	38.1	-3.87	14	12.4	13.1		5.77	4.5	2.4		42.5
65	96.9	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE	2	15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK	POSITIVE	POSITIVE	Y	Y	N		N	N	Y	Y	N	N	N	NO	YES	8	42.1	35.9	-6.2	14.6	12.1	9.6	7.5	7.62	10	20.3	25.1	38.7
66	98	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH RESPIRAT	POSITIVE	POSITIVE	Y	Y	Y	PULMONARY & GIT	Y	Y	Y	Y	Y	Y	N	NO	YES	22	23.2	20.8	-2.4	8.6	7.2	7.3	10.4	6.36	8.1	10.6	20.5	81.6
67	99	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L AIR ENTRY REDUCED AT BASE	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH MULTIORGAN DYSFUNCTION WITH HYPOTENSIVE SHOCK WITH	POSITIVE	POSITIVE	Y	Y	Y	GIT	Y	Y	Y	Y	Y	N	N	NO	YES	18	52	50.2	-1.8	14.4	14.1			6.47	27.5			83.6
68	98.5	NORMAL	HYPOTENSIVE SHOCK	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		Y	N	N	Y	N	N	N	NO	YES	8	51	53	2	16.4	16.9	14.9	13.2	4.18	8.74	11	11.1	69
69	98	PALLOR	HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	B/L EQUAL AIR ENTRY	PALPABLE	NOT PALPABLE		15	NORMAL	SEVERE DENGUE WITH HYPOTENSIVE SHOCK WITH RESPIRATORY DISTRESS	POSITIVE	POSITIVE	Y	Y	N		N	N	N	Y	N	N	N	NO	YES	6	42.6	38.4	4.2	10.6	8.1	7.9	7.8	10.67	8.14	6.7	9.3	30
70	97.6	PALLOR	COMPENSATED SHOCK WITH RESPIRATORY DISTRESS	B/L EQUAL AIR ENTRY	PALPABLE	PALPABLE	3	15	NORMAL	SEVERE DENGUE WITH COMPENSATED SHOCK WITH RESPIRATORY DISTRESS WITH UPPER GI BLEED		POSITIVE	N	Y	Y	GIT	N	N	N	Y	N	N	N	NO	YES	4	38.4	36.2	2.2	7.5	9.4	8.2		4.67	6	5.7		30.2

Sr. No.		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
1	32	33.5	57.2	31.7	58	43.4	45.2	48000	50000	68000	58000	48000	1.09				106	88			33	27			68	40	39	29	0.77	0.42	0.49	0.48	18.4	19.4	19.8		4.8	6.2
2	10.3	71.8	9.7	69.5	22.1	56	32.8	28000	21000	20,000	22000	20000	1.34		1.1		73		67		25		23		31	11	6	7	0.74	0.45	0.43	0.47	12.2	22.2	31.2	30.2	4.4	1.4
3	35.8	50	40	43.6	46.3	49.1	39.5	12000	37000	149000	272000	12000	2.95		1.2		69	101	89		26	49	58		37	16	13		0.54	0.3	0.37		25.2	24.8	26.6		2.8	1.5
4	21	42.6	47.7	55	33	41.3	46.2	50000	58000	69000	102000	50000	2.01	1.6			10214			1122	3529			711	34	11	12	21	0.385	0.26	0.22	0.29	20.9	23.4			5	2.9
5	16.9	69.9	19.2	56.9	31.9	59.6	28	11000	14000	24000	31000	11000	2.08				1910		912		814		406		21				0.62				21.2	25.9			4.5	1.7
6	27.1	69.3	20	55.8	27	20.3	66.4	160000	142000	140000	155000	140000	1.18				58		44	76	35		49	53	8		11	12	0.37		0.53	0.44	21.4		18.8		1.9	
7	44.5	49	39.2	58.4	31	59.2	30.2	14000	46000	51000	87000	14000	1.35				124	75			41	31			22	19	18		0.51	0.32	0.31		23.2	3.2			3.2	
8	32.8	49.3	39.4	42.1	42.5	44.7	12	24000	9000	30000	23000	9000	3.05		1.05		1540	847	154	162	1244	602	87	97	33		12	13	0.57		0.43	0.37	14	17.8	24.2	27.4	5.3	1
9	25.7	73.7	17.5	72.2	15.5	78	15.5	12000	14000	55000	93000	12000	2.68	1.64	1.22		16913	6923	9185	4808	1896	4583	3027	3055	31	86	101	152	1.61	1.82	2.43	3.71	9.1	12.5	18.5	18.6	15	13.5
10	40	43	46.4	47	39	43.5	42.1	28000	37000	53000	70000	28000	2.3				1090	737		923	317	293		506	48	59	69		0.87	1.28	0.92		18.8	19.9			3.9	1.8
11	20.9	61.4	32.5	37.9	50.9	29.6	59.9	40000	17000	9000	14000	9000	1.15				213				76				51				0.81				24.2				5.5	

Sr. No.		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
12	52.7	41.6	48.6	35.9	52.6	32.6	54	24000	32000	59000	24000	24000	1.03				561				177				15				0.33				24.6				1.7	
13	31.2	73.4	14.5	78.6	11.9	79.2	11	120000	92000	88000	90000	88000	1.1	1.49				355				139			82	79	43	33	1.69	1.48	1.15	0.92	14	27.4	27.8	27.7	15	0.7
14	20.2	65.3	24.3	69.7	19	77.5	13.2	22000	14000	22000	56000	14000	1.42				1320	6468	1774	4898	623	379	1774	1934	942	59	39	42	34	1	0.46	0.45	0.31	13.3	20.1	24.5	5.5	3.4
15	33.3	46.4	40.3	49.3	39.1	35.7	50.5	18000	40000	33000	70000	18000	1.15				112	99	96		28	26	27		49	8	8	7	0.41	0.22	0.24	0.23	18.6	22.4			4.3	2.6
16	23.5	40	30.3	45.8	40.1	55.4	33.2	22000	16000	7000	73000	7000	1.52		1.85	1.32	3751		8006	3253	1820		2918	1852	39	61	85	113	1.33	1.32	2.66	3.83	16.5	18.1	18.9	21.5	5.3	3.5
17	33.9	64	23	45	43	38.6	49.1	48000	32000	32000	22000	22000	1.31				438				135				35	32	11	7		0.52	0.38	0.34	0.3	21.9			1	
18	21.7	78.5	31.3	47.2	42	45.2	45.7	14000	20000	30000	50000	14000	1.63		1.08		1011	1054		470	267	263		215	77	47	46	39	1.15	0.62	0.58	0.57	13.5	19.5	24.9		8	1.8
19	27	59	25	65	25.6	70.7	20.6	20000	14000	38000	42000	14000	1.2	1.4		1.6	496	1392	24943		266	555	5365		51	46	56	69	1.76	1.32	1.35	1.63	15.1	18.4	22.9	25.9	7.6	6.7
20	44	46	40.2	54.2	31	56.2	30.1	44000	32000	48000	65000	32000	1.1	1.4			371	540			487	285			47	27	12		0.44	0.35	0.26		23.2	24.6			2.8	1.6
21	27.7	48.8	43.1	37.5	53.7	28.9	58.6	49000	72000	134000	173000	49000	1.12	1.2			199				180				27	26	19		0.65	0.39	0.47		18.8	21			3.6	2.4

Sr. No.		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY2)	BICARBONATE (DAY3)	BICARBONATE(DAY4)	LACTATE (D1)	LACTATE (D2)
22	45	46	50	56	32	47.1	44.9	10000	16000	28000	32000	10000	1.9				363			593	480			624		37				0.56			11.2	19.7	28.8		15	9.5
23	47	37	48	38.5	55.9	30.9	61.7	16000	14000	40000	40000	14000	1.15				559				617				24	26	12		0.4	0.6	0.58		23	17.7	24.4		1.1	3.1
24	44.8	42.5	44.5	44.2	41.3	46.9	49.6	42000	44000	56000	82000	42000	1.25				519		196		174		109		48			22	0.49			0.36	21.8	23.5			0.8	1
25	26	13.5	73.7	71.8	17.2	69.8	17.9	50000	60000	50000	74000	50000	1.65	1.2		2.7	5401	4070	18381	6746	2594	4889	4339	3510	44	86		30	0.89	2.09		0.91	11.9	20.2	18.7	16.6	8.6	2.4
26	53.5	30	65	36	60	36	60	78000	68000	108000	122000	78000	1.68	1.64		1.12	993	713		399	345	235		194	14	18			0.2	0.25			18	19.4			2.3	1.8
27	24.3	50.3	37.8	53	35	61	27	30000	32000	68000	130000	30000	1.19	1.45			2732	1675	1182		1643	929	973		53	41			0.9	0.7			16.3	24.7			6	1.5
28	45.9	41.4	46.8	38.3	49.1	59	29.9	26000	100000	70000	64000	26000	2.09	1.97			524	860	1840		180	331	893		82	68	80	69	0.73	0.6	0.6	0.54	10.5	22.1	28.8		12.6	5
29	29.9	64.3	25.1	62.2	26.8	57.4	34	16000	16000	20000	82000	16000	1.47		1.65		12492		2241	1275	4775		1488	1286	59		22		1.07		0.51		19.9		24.7		4.6	
30	56.4	54.2	33.8	52.7	25.6	58.7	25.6	12000	20000	16000	28000	12000	0	2.1	1.5		284		642		119		303		51		38		0.69		0.4		15.9	19	20.2	22	7.1	6.1

Sr. No		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
31	20.4	68.8	25.2	75.3	15.3	71	20.6	40000	22000	18000	50000	18000	2.13	1.99	1.79		9525	5955	2878	1802	6115	2239	3973	781	74	46	48	29	1.1	0.99	0.84	0.62	14.3	24.4			5.2	3.7
32	16.1	70	20	75.5	10.3	68	16	62000	30000	40000	60000	30000					221	227	246	196	82	89	132	174	25	23	17	30	0.76	1.63	0.62	0.52	19.3	19.8	25.9		2.5	2
33	26.1	46.3	42	56	34.1	31.3	52.1	62000	50000	60000	62000	50000	1.19				18	65			9	28			9				0.29				20.2				1.8	
34	32	61	35	66.2	30.1	43.6	48.1	64000	70000	70000	166000	64000	1.26				965	542		263	499	388		350	54	46		25	1.17	0.63		0.4	14.4	26.4			7.1	1.2
35	13.8	74	17.8	67.1	19.1	76.4	14.7	12000	8000	73000	106000	12000	1.6	1.7	1.39		943	6316	5542	2117	421	2867	3941	1907	70	36	39	27	1.55	0.52	0.44	0.44	21.7	24.5			7.1	2.9
36	50	52.2	40.2	60.1	28.8	63.8	24.9	27000	75000	138000	170000	27000	2.18	1.52	1.34		4011	6087	2848	1478	4579	1831	1364	888	67	104	120	141	0.48	0.91	1.13	1.4	19.5	25.3	29.2	27.3	12.9	6.3
37	48.2	58	27	52	38	50	387.8	21000	22000	22000	50000	21000	1.1				183				95				34	29	39	44	0.62	0.59	0.75	0.5	12.5	14.6	19.6		4.7	3
38	36	56.2	34.1	55.6	33.5	62.7	26.5	22000	30000	22000	44000	22000	1.7				212		181		82		87		46	38			0.71	0.54			21.9					2
39	55	52	39	60.8	29	39.7	48.2	22000	54000	80000	130000	22000	1.76				5256	3934	1229	183	2138	1520	1140	496	37	29			0.74	0.4			18.7	22.7	25	25.4	3.1	2.3
40	45.1	26.4	59.3	55.9	33.4	45	40	20000	22000	47000	106000	20000	1.8				401			370	160			255	27	23	15	25	0.5	0.5	0.4	0.34	21.6		32.1	34.7	2.3	
41	8.5	86	7.4	87	9	93	4.6	40000	70000	50000	57000	40000	1.7	1.8			8542	4426	2321	785	3391	538	1481	212	16	9	19	13	0.54	0.32	0.3	0.28	24	25.8	29.1	24.4	0.9	0.8
42	50	40	50	48.1	43.3	50	39	74000	86000	90000	96000	74000	1.26				325				103				21			12	0.37			0.34	23				2.9	
43	20.8	80.7	14	54.9	33.8	51.4	39.5	51000	29000	22000	42000	22000	1.27	1.1			104	134			40	50			19				0.64				23.4				1.3	

Sr. No		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
44	78	91.4	3.5	79.8	8.7	74.5	16.1	283000	180000	96000	47000	47000	1.43				18	10			12	7		29	10				0.55	0.47			19.8				3.8	
45	5.1	82.9	6.4	84	5.8	85.5	5.7	69000	90000	150000	175000	69000	2.12	1.67		1.4	8231		1931	1292	3346		1297	1166	92		126	160	1.02		2.28	3.16	25.1	20.3	20.2	17.6	2	1.8
46	27.4	69.9	19.3					80000	120000			80000	2.23	2.2			4782	6593			1814	2419			52	45			2.08	1.62			16.5	17			6.5	9
47	14.3	77.6	11.5	67.4	21.6	47.6	48.9	50000	52000	98000	110000	50000	1.07				156				72				39				0.58				21.6				1.3	
48	47.1	19.3	69.2	33	57	39.3	54.3	24000	21000	28000	37000	21000	1.06				289				86				19				0.76				25.7				1.5	
49	29.3	60.1	27.6	61.3	28	56.7	32	60000	76000	94000	146000	60000	1.27		1.8		5637	8888	5046	839	5699	5356	3039	1285	42	53	74	101	1.29	1.6	2.96	4.08	16.7	20.6	19	19.7	2.4	2.04
50	38.4	53.6	35.3	58	30	66.4	23.3	18000	15000	42000	30000	15000	1.75	2.6			3529	975		30105	865	310		4332	43	21	46	59	0.63	0.32	1.64	2.54	19.4	17.5	9.8	8.3	3	3.5
51	40	50	40	44.6	44.3	43.6	46.3	11000	37000	65000	149000	11000	0.95				69	70	101	89	26	27	49	58	37	20	16	13	0.54	0.41	0.3	0.3	25.2	29.1	30.4		1.5	1.5
52	26.4	76	12.2	76	13.5			32000	150000	200000		32000	3.99	2.73	2.52		41709	7957		6068	8714	3941		1824	100	120	124	128	2.71	4.03	5.05	4.71	8.5	9.7	12.7	12.8	10.2	9.7
53	25.6	67.8	21.9	50	40	57.3	31.4	33000	30000	90000	96000	30000	1.54		1.57			4360	2953	1954		1764	1285	1051	82	74	71	69	0.96	0.88	1.22	1.22	15.9	23.7	23.5	31.1	9.2	3.7

Sr. No		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
54	35.7	54.8	36.3	60.2	28.6	56	33	34000	32000	32000	36000	32000	1.28				326				86		22	13	39		22	13	0.41	21.8	0.28	0.37	21.6	21.8	27.7		4.11	4.4
55	8.1	93.5	3.7	95	3.9	89	8.2	130000	80000	60000	60000	60000	1.1			1.85	73			457	50			96	83	135	158	196	1.73	2.57	2.84	4	16.3	13.3	13.1	11.7	3.5	1.6
56	35.1	62.7	26.3	59.2	29.3	53.2	36	30000	33000	66000	90000	90000	1.05				288	249	161		149	116	80		29	31	14		0.48	0.04	0.33		18.2	10	16.5		3.2	8.2
57	28	51.6	36.9	53.6	35.7	59.8	28.7	40000	36000	72000	120000	36000	1.38				903				363				51				0.989				15				4.9	
58	46	46.4	34.3	50.1	33	52	41.6	60000	62000	68000	700000	60000	1.32				446		252		319		141		48	33	21		0.8	0.6	0.3		19.8	20.4			3.2	2.8
59	21.3	85.2	4.7	84.2	5.2			10000	32000	32000		10000	1.9		1.64		451		7407		188		3809		46	96	113		1.57	3.24	4.09		13.4	17	15.9		7.7	5.5
60	35.7	34	55	26.6	66	45	46	30000	32000	28000	52000	28000	1.24				163				89				17				0.54				22.9	23.2	29	28.9	3.1	1.5
61	28.9	59.7	27.9	57	39.9	56.4	34.1	6000	30000	60000	86000	6000	1.5	1.5			8834	8324	3086	631	2823	2129	1575	968	53			40	0.81			0.49	10	27.9	27.6		13.4	2.1
62	17	91	7.4	83	16	92.9	5.3	180000	192000	114000	100000	80000	1.8		1.9		457	5825	3095		111	3037	2267		52		47	52	1.08		1.87	2	13.4	14.9	17.1	17.2	4.4	4

Sr. No		DLC(D2)		DLC(D3)		DLC(D4)		PLT (D1)	PLT (D2)	PLT (D3)	PLT(D4)	LOWEST PLATELET COUNT	INR(D1)	INR(D2)	INR(D3)	INR(D4)	SGOT(D1)	SGOT(D2)	SGOT(D3)	SGOT(D4)	SGPT(D1)	SGPT(D2)	SGPT(D3)	SGPT(D4)	UREA(D1)	UREA(D2)	UREA(D3)	UREA(D4)	CREATININE(D1)	CREATININE(D2)	CREATININE(D3)	CREATININE(D4)	BICARBONATE(D1)	BICARBONATE (DAY 2)	BICARBONATE (DAY 3)	BICARBONATE(DAY 4)	LACTATE (D1)	LACTATE (D2)
63	32.1	72.7	26.5	67.3	30.4	49.6	41.4	32000	60000	90000	202000	32000	1				244				97				31		28		0.48		0.31		20.5	21.8	23.6		3.6	2.8
64	46.3	50.6	37.7	61.9	35.5			46000	30000	48000		30000	1.48				126		140		40		60		17		11		0.48		0.46		22	24.9	27.7		2	1.8
65	58.4	54.7	34.4	53.4	29.1	61.7	27.2	12000	20000	16000	28000	12000	0	2.1	1.5		284		642		119		303		51		38		0.69		0.48		15.9	19	20		7.1	6.1
66	15	71	18.6	68.6	21.2	61	22.4	84000	48000	38000	46000	38000	1.2		1.4		192	876	3983	514	60	514	2275	914	137		250	382	1.66		4.4	6.11	21.5	18	18.2	19.8	1.2	1.4
67	12.1	72.8	17.6					40000	30000			30000	1.6				257	1255			1142	651			35	44			0.81	1.64			19.3	8.8			5	12.5
68	24	56	32	52	32	52.8	31.9	33000	30000	25000	22000	2200	2	1.8			1290		628	2276	516		293	1109	43		26	39	0.66		0.62	0.43	18.3		20.2	21.5	4.2	
69	64	29.9	59.8	40	56	20.1	68.2	40000	24000	40000	30000	24000	1.5				1156	1185	636	252	391	509	378	301	79			16	0.5			0.35	16.5	19.5			3.7	1.4
70	59.4	38.5	48.7	28.4	60.8			62000	82000	128000		62000	1.07				170	137			109	107			26				0.32				24.4				2.6	

S/. No	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (Days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
1	7.2		PLEURAL EFFUSION	NORMAL	20	1.1	N		13.4	-24.8	-30.45	-41.85	Y	1	Y	3	N		N				N		N	N	N		N		N	N	Y	Y	5	DISCHARGE	6	19/10/2022
2	1.2	0.9	PLEURAL EFFUSION	ASCITES	30	0.62	N		27.5	-31.25	-12.3	-16	Y	2	N		N		Y	1	15	15	N		N	N	N		N		N	N	N	N	4	DISCHARGE	6	9/9/2022
3	0.7		RIGHT PLEURAL EFFUSION	MODERATE ASCITES	15	0.71	Y	5	4	-7.8	-50	-53.8	Y	1	N		N		N				Y	GIT	N	N	N		Y	2	N	N	N	N	4	DISCHARGE	7	29/10/2021
4			B/L PLEURAL EFFUSION		10	0.5	Y	10	14.7	3.9	-2.24	16.3	Y	1	Y	2	N		Y	2		10	Y	GIT	N	N	N		Y	1	N	N	Y	Y	3	DISCHARGE	10	19/11/2021
5			PLEURAL EFFUSION		10	0.38	N		40	8.18	2.38	5.56	Y	3	Y	2	N		Y	3	4	4	N		N	N	N		N		N	N	Y	Y	1	DISCHARGE	6	18/11/2021
6	3.4		PLEURAL EFFUSION		10	0.54	N		23	-19.6	-11.5	-8.12	Y	4	N		N		Y	2	10	10	N		N	N	N		N		N	N	N	N	3	DISCHARGE	6	31/10/2021
7			MODERATE B/L PLEURAL EFFUSION	MODERATE ASCITES	10	0.89	N		56	-8	-19	28	Y	2	Y	3	N		Y	2	4	24	N		N	N	N		N		N	N	Y	Y	3	DISCHARGE	8	27/10/2023
8	1.2	1.6	MODERATE B/L PLEURAL EFFUSION	MODERATE ASCITES	20	0.45	Y	10	47.2	3.27	-15	-35.47	Y	2	Y	2	N		Y	3	16	20	N		N	N	N		Y	4	N	N	N	N	4	DISCHARGE	9	29/10/2021
9	3.9	2.5	B/L PLEURAL EFFUSION	MODERATE ASCITES	20	0.9	Y	10	39.6	19.8	-14.8	44.5	Y	2	Y	3	Y	14	Y	1	22	42	N		N	Y	Y	1	Y	2	Y	N	Y	Y	17	DISCHARGE	25	31/10/2021
10			B/L PLEURAL EFFUSION	MILD ASCITES	10	0.58	N		38	-3.02	-11.6	23.2	Y	4	N		N		N				N		N	N	N		N		N	N	N	N	3	DISCHARGE	6	14/11/2021
11			NORMAL	NORMAL	10	0.55	Y	5	28	8.6	-16	20.6	N		N		N		N				N		N	N	N		Y	1	N	N	N	N	0	DISCHARGE	8	23/11/2021

S. No.	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
12			B/L PLEURAL EFFUSION	NORMAL	10	1.19	Y	10	48	-26.96	-21	0.1	Y	4	N		N		N				N		N	N	N		N		N	N	N	N	0	DISCHARGE	6	17/11/2021
13	0.6	0.6	B/L PLEURAL EFFUSION	MILD ASCITES	20	0.625	N		26.9	20.5	-3.95	43.48	Y	2	N		Y	6	Y	4	10	60	Y	GIT	N	N	Y	4	Y	2	N	N	Y	Y	7	DISCHARGE	11	21/11/2021
14	1.7		B/L PLEURAL EFFUSION	MODERATE ASCITES	20	0.5	Y	10	7.18	-13	-4.4	-10.26	Y	2	Y	4	N		Y	1	30	30	N		N	N	N		N		N	N	N	N	4	DISCHARGE	9	11/10/2021
15			B/L PLEURAL EFFUSION	MODERATE ASCITES	10	1.8	N		27.7	-30.4	-47.4	-77.8	Y	1	Y	1	N		Y	2	50	50	Y	GIT	N	N	N		Y	1	N	N	N	N	3	DISCHARGE	6	2/11/2021
16	2.2	1.2	B/L PLEURAL EFFUSION		10	0.47	N		23	-1.56	-50.2	-28	Y	3	Y	2	N		Y	2	4	4	N		N	N	N		Y	2	Y	N	Y	Y	10	DISCHARGE	13	1/1/2022
17			B/L PLEURAL EFFUSION		20	1.2	Y	10	-3.8	-45.4	-43.9	-93.1	Y	2	N		N		Y	1		10	N		N	N	N		N		N	N	N	N	4	DISCHARGE	6	5/11/2022
18	0.8		B/L PLEURAL EFFUSION	ASCITES	20	1.3	Y	10	21.3	-15.7	-16.1	-10.5	Y	2	Y	4	N		N				N		N	N	N		N		Y	N	N	N	6	DISCHARGE	8	28/11/2022
19	3.6	1.8	B/L PLEURAL EFFUSION	ASCITES	30	0.36	Y	10	26.4	36.2	-17.4	45.7	Y	2	Y	3	Y	14	Y	13	50	130	N		N	N	Y	1	Y	6	Y	N	Y	Y	23	DISCHARGE	38	27/12/2022
20			NORMAL	NORMAL	10	0.8	N		6.2	-8.4	-10.2	-12.4	Y	1	N		N		Y	1	4	4	N		N	N	N		Y	1	N	N	N	N	1	DISCHARGE	4	22/08/2023
21			NORMAL	NORMAL	10	0.76	N		8.8	-6.7	-12.6	-10.5	Y	1	Y	1	N		Y	2	6	6	Y	SKIN	N	N	Y	1	N		N	N	N	N	1	DISCHARGE	3	21/10/2022

S/. No	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (Days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
22	2.5		B/L PLEURAL EFFUSION	NORMAL	20	0.7	N		13.3	-0.91	-21.4	-9	Y	2	N		N		Y	2		20	N		N	N	Y	1	Y	2	N	N	N	N	3	DISCHARGE	7	3/9/2023
23	1		B/L PLEURAL EFFUSION	NORMAL	10	0.56	N		31.2	6.8	-9.7	28.2	Y	1	Y	2	N		N				N		N	N	N		Y	2	N	N	N	N	4	DISCHARGE	7	17/08/2023
24			B/L PLEURAL EFFUSION	NORMAL	10	1.6	N		12.4	-1.09	-4.14	7.16	Y	2	N		N		N				N		N	N	N		N		N	N	N	N	1	DISCHARGE	8	6/10/2023
25	1.6	4.1	B/L PLEURAL EFFUSION	MODERATE ASCITES	10	0.4	Y	10	29.3	15.6	12.15	57.05	N		Y	1	Y	4	Y	4	30	60	N		N	N	Y	1	Y	2	Y	Y	Y	Y	5	DEATH	5	17/9/2023
26			B/L PLEURAL EFFUSION	MODERATE ASCITES	10	1.6	N		-11	-20	-16.2	-47.2	Y	2	Y	1	N		Y	1		50	N		N	N	N		N		N	N	N	N	2	DISCHARGE	9	26/09/2023
27			NORMAL	NORMAL	10	0.71	N		-3.8	-13.5	-37.7	-55	Y	2	N		N		N				N		N	N	N		N		N	N	N	N	1	DISCHARGE	5	2/11/2023
28	2		B/L PLEURAL EFFUSION	NORMAL	20	1.6	N		33	-57.4	-18.2	-42.6	N		Y	4	N		Y	1	10	40	N		N	N	N		Y	1	N	N	N	N	5	DISCHARGE	10	31/10/2023
29	1.9		RIGHT PLEURAL EFFUSION	NORMAL	10	0.43	N		12.2	9	-5.5	-15.7	Y	1	Y	2	N		N				N		N	N	N		N		N	N	N	N	4	DISCHARGE	8	25/12/2023
30	5.4		B/L PLEURAL EFFUSION	MODERATE ASCITES	10	1.92	N		8.6	-2.6	-10.2	-4.2	Y	1	Y	1	N		N				N		N	N	N		N		N	N	N	N	1	DISCHARGE	3	2/11/2023

S. No.	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (Days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
31			B/L PLEURAL EFFUSION	MODERATE ASCITES	20	0.6	N		1.9	16.8	11.3	30	Y	1	Y	1	N		N				N		N	N	N		N	1	Y	N	N	N	3	DISCHARGE	6	4/12/2023
32	2.1		RIGHT PLEURAL EFFUSION	NORMAL	10	0.7	N		23	-1.09	-27.9	-6.04	Y	2	Y	3	N		N				N		N	N	N		N		N	N	Y	N	5	DISCHARGE	8	2/11/2023
33			NORMAL	NORMAL	10	1	N		43.8	20.8	-8.4	56.2	Y	1	N		N		N				N		N	N	N		N		N	N	N	N	2	DISCHARGE	5	16/10/2023
34			B/L PLEURAL EFFUSION	NORMAL	10	0.35	N		-0.6	-8.45	-1.8	-10.85	Y	3	N		N		Y	1	30	30	N		N	N	N		N		N	N	N	N	3	DISCHARGE	7	10/11/2023
35			NORMAL	NORMAL	10	0.43	N		-7.72	3.74	-5.68	-9.66	N		N		N		Y	1		25	N		N	N	N		N		N	N	N	N	2	DISCHARGE	7	27/11/2023
36	2.2	1.5	B/L PLEURAL EFFUSION	ASCITES	20		Y	10	63.3	33.68	-36.25	60.7	Y	2	Y	2	Y	8	Y	6	20	30	Y	GIT	N	N	Y	4	Y	1	N	N	Y	Y	11	DISCHARGE	21	17/11/2021
37	3.9		B/L PLEURAL EFFUSION	NORMAL	20		Y	20	64	12	-15	61	Y	2	Y	1	N		Y	4	8	68	N		N	N	N		N		N	N	Y	Y	5	DISCHARGE	8	3/12/2021
38			B/L PLEURAL EFFUSION	NORMAL	20		Y	10	12.7	50.4	-10.12	52.9	Y	4	N		N		Y	2	4	4	N		N	N	N		N		N	N	Y	Y	4	DISCHARGE	6	18/9/2021
39	1.6	1.1	B/L PLEURAL EFFUSION	MILD ASCITES	30		Y	10	39.5	11.7	-14	37.2	Y	3	Y	1	N		Y	3	8	18	N		N	N	N		N		N	N	Y	Y	4	DISCHARGE	7	30/8/2021
40	1.1	1	B/L PLEURAL EFFUSION	MODERATE ASCITES	10		Y	10	-4.4	11.7	-3.4	3.9	Y	2	Y	3	N		Y	4	10	20	Y	SKIN	N	N	Y	1	Y	2	N	N	Y	Y	4	DISCHARGE	7	13/9/2021
41	2	0.4	B/L PLEURAL EFFUSION	MILD ASCITES	20		Y	10	28	20	-6	42	Y	5	Y	1	Y	3	Y	4	6	16	N		N	N	N		N		N	N	N	N	7	DISCHARGE	9	17/9/2022
42			B/L PLEURAL EFFUSION	MILD ASCITES	20		Y	10	31.6	31.6	-1.6	61.6	Y	3	N		N		Y	2	4	4	N		N	N	N		N		N	N	N	N	3	DISCHARGE	6	24/11/2022
43			RIGHT PLEURAL EFFUSION	MILD ASCITES	20		Y	10	19.3	19.5	-3	35.17	Y	3	Y	1	N		Y	2		20	N		N	N	N		N		N	N	N	N	3	DISCHARGE	6	21/11/2022

Sr. No	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
44			LEFT PLEURAL EFFUSION	MILD ASCITES	20		Y	10	35	11.4	6	52.4	Y	2	Y	2	N		Y	3	40	50	Y	ORAL CAVITY & GIT	N	N	N		N		N	N	Y	Y	4	DISCHARGE	8	10/11/2022
45	1.8	1.3	B/L PLEURAL EFFUSION	MODERATE ASCITES	10		N		60.1	38.6	37.4	136.1	Y	1	Y	2	Y	14	Y	6	60	120	Y	PULMONARY & GIT	N	N	N		Y	2	Y	Y	Y	Y	14	DEATH	14	6/11/2021
46			B/L PLEURAL EFFUSION	MODERATE ASCITES	20		Y	10	65.2	652	36.62	753.8	Y	1	N		Y	4	Y	4	60	140	Y	PULMONARY & GIT	N	N	Y	2	Y	4	Y	Y	Y	Y	4	DAMA	4	19/12/2022
47			LEFT PLEURAL EFFUSION	NORMAL	10		Y	20	47.18	-39.9	12.18	19.4	Y	3	Y	1	N		Y	2	40	40	Y	NOSE & GIT	N	N	Y	1	Y	1	N	N	N	N		DISCHARGE	5	13/11/2021
48			B/L PLEURAL EFFUSION	NORMAL	10		Y	10	16.3	10.1	18.9	136	Y	1	Y	2	N		N				N		N	N	N		N		N	N	N	N		DISCHARGE	5	22/11/2022
49	2	1.74	B/L PLEURAL EFFUSION	MODERATE ASCITES	10		Y	10	24.3	7.69	-1.2	30.7	Y	5	Y	5	N		Y	4	6	6	N		N	N	N	N		N		Y	N	Y	Y	6	DISCHARGE	18	29/10/2021
50	10.3	10.2	B/L PLEURAL EFFUSION	MODERATE ASCITES	20		Y	10	120	30.6	93.4	244	Y	1	Y	2	Y	8	Y	8	114	214	Y	ORAL CAVITY & GIT	N	N	Y	2	Y	5	Y	Y	Y	Y	9	DEATH	10	9/10/2021
51	1.1		RIGHT PLEURAL EFFUSION	MODERATE ASCITES	15		Y	10	4.14	-7.8	-50	-53.8	Y	2	Y	2	N		Y	3	5	5	N		N	N	N		Y	2	N	N	N	N	3	DISCHARGE	7	29/10/2021
52	8.8	10.4	B/L PLEURAL EFFUSION	MODERATE ASCITES	20		N		43.3	58.8	79.12	181.26	N		N		Y	4	Y	4	100	200	Y	GIT	Y	Y	Y	3	Y	5	Y	Y	Y	Y	4	DEATH	4	18/11/2021
53	1.6	1.1	RIGHT PLEURAL EFFUSION	MODERATE ASCITES	10		Y	10	72.5	-19.1	-39.4	13.9	Y	1	Y	4	N		Y	2	10	10	Y	GIT	N	N	Y	1	Y	3	Y	N	Y	Y	3	DISCHARGE	7	15/10/2021

S. No	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (Days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
54	3.5		B/L PLEURAL EFFUSION		20		N		4.84	14.84	-7.2	12.48	Y	2	Y	3	N		Y	2	20	40	N		N	N	N		N		N	N	Y	Y	4	DISCHARGE	6	2/11/2022
55	2.1	1.7	B/L PLEURAL EFFUSION	MILD ASCITES	20		N		106	59.17	92	257	Y	1	Y	1	Y	2	Y	4	40	80	N		N	N	N		N		Y	Y	Y	Y	Y	4	DEATH	4	17/8/2021
56	5		RIGHT PLEURAL EFFUSION		10		Y	10	1.8	0.25	-10	-8.5	Y	2	Y	2	N		Y	2	20	35	N		N	N	N		N		N	N	N	N	2	DISCHARGE	7	25/10/2021
57			RIGHT PLEURAL EFFUSION	MILD ASCITES	10		Y	10	23.28	7.7	-0.5	30.48	Y	2	Y	1	N		Y	1	4	4	N		N	N	N		N		N	N	N	N	4	DISCHARGE	7	28/8/2023
58			LEFT PLEURAL EFFUSION		20		N		16.4	7.8	-4.2	20	Y	3	Y	3	N		Y	2	6	6	N		N	N	N		N		N	N	N	N	3	DISCHARGE	7	30/08/2023
59	5.3		B/L PLEURAL EFFUSION	MODERATE ASCITES	20		Y	10	28.2	44.2	48.6	121	N		Y	2	Y	1	Y	3	30	60	Y	SKIN	N	N	Y	2	Y	4	Y	Y	Y	Y	3	DEATH	3	13/08/2023
60	1.2	1.6	B/L PLEURAL EFFUSION	MILD ASCITES	20		Y	10	23	42.3	5.36	70.66	Y	1	Y	3	N		Y	1	4	4	N		N	N	N		N		N	N	N	N	4	DISCHARGE	7	2/9/2023
61	2.5		MILD PLEURAL EFFUSION		20		Y	10	18.2	14.1	-6.4	25.9	Y	2	N		N		Y	2	20	20	N		N	N	N		Y	5	N	N	N	N	5	DISCHARGE	7	16/10/2023
62	1	1.2	MILD PLEURAL EFFUSION	MILD ASCITES	20		Y	10	39.1	-9.4	-6.3	23.4	Y	1	Y	3	Y	10	Y	5		50	Y	GIT	N	N	N		N		Y	N	Y	Y	14	DISCHARGE	17	21/12/2023

S/. No	LACTATE(D3)	LACTATE(D4)	CHEST XRAY	USG ABDOMEN	NS BOLUS (ML/KG)	25%ALBUMIN (GM/G)	COLLOID BOLUS (Y/N)	COLLOID BOLUS(ML/KG)	DAY 1 PFB	DAY 2 PFB	DAY 3PFB	GRAND PFB	NEED FOR OXYGEN (Y/N)	OXYGEN (Days)	NEED FOR NIV (Y/N)	NIV (DAYS)	NEED FOR MECHANICAL VENTILATION (Y/N)	MECHANICAL VENTILATION (DAYS)	INOTROPES (Y/N)	INOTROPES (DAYS)	IS	VIS	MAJOR BLEEDING (Y/N)	SITE OF BLEED	ABDOMINAL DRAIN (Y/N)	PLEURAL TAP	PRBC TRANSF	NO. OF PRBC TRANSFUSED	PLATELET TRANSF	NO. OF RDP TRANSFUSED	AKI	DIALYSIS	DIURETIC	LASIX INFUSION	PICU STAY (DAYS)	OUTCOME	HOSPITAL STAY (DAYS)	DOD
63	1.3		MILD PLEURAL EFFUSION	MILD ASCITES	20		N		54.8	4	4.8	63.65	Y	1	Y	2	N		Y	2		20	Y	GIT	N	N	Y	1	N		N	N	N	N	3	DISCHARGE	9	21/9/2023
64	0.9		MILD PLEURAL EFFUSION		10		N		56.6	18	7.5	82.1	N		N		N		Y	1	15	15	N		N	N	N		N		N	N	N	N	2	DISCHARGE	4	13/10/2023
65	4.4		MILD PLEURAL EFFUSION	MODERATE ASCITES	10		N		40.4	-1.7	2.3	41	Y	4	N		N		Y		55	55	N		N	N	N		Y	2	N	N	N	Y	4	DISCHARGE	10	24/10/2023
66	1.4	2.2	B/L PLEURAL EFFUSION	MODERATE ASCITES	10		N		2.02	15.8	26	43.82	Y	1	N		Y	6	Y	5	105	205	Y	PULMONARY & GIT	N	N	Y	1	Y	2	Y	Y	Y	Y	6	DEATH	6	4/11/2023
67			B/L PLEURAL EFFUSION	MODERATE ASCITES	10		Y	10	21.1	28.7		49.8	Y	1	N		Y	1	Y	2	100	200	Y	PULMONARY & GIT	N	N	N		Y	2	Y	Y	Y	Y	2	DEATH	2	17/11/2023
68	6.8	6.9	B/L PLEURAL EFFUSION		20		Y	10	26	14.6	17	57.6	Y	1	Y	2	N		Y	2	5	35	N		N	N	N		Y	1	N	N	Y	Y	5	DISCHARGE	11	14/11/2023
69			MILD PLEURAL EFFUSION		10		Y	10	21.9	-5.7	-34.4	-18.2	Y	3	N		N		Y	2	10	10	N		N	N	N		N		N	N	N	N	2	DISCHARGE	7	23/11/2023
70			MILD PLEURAL EFFUSION	MILD ASCITES	10		N		-1.2	7.5	0	6.3	Y	3	Y	1	N		N				Y	GIT	N	N	Y	1	Y	2	N	N	N	N	3	DISCHARGE	4	13/9/2023

Baba Farid University
of Health Sciences
Sadiq Road
Faridkot-151 203 (Pb). INDIA.
Phone : 01639-256232,256236
Tele/Fax : 01639-256235
Email – Thesisbfuhs@gmail.com

(39)

No. BFUHS/2K23p-TH/ 25 Date 1/1/24

The Principal
Dayanand Medical College & Hospital
Ludhiana

Subject:: Approval of Plan of Thesis.

This is to inform you that the Faculty of Medical Sciences in its meeting held on 25.09.2023 has approved the plan of thesis of **Amandeep Kaur**, a student of your college for **MD Paediatrics** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis
Effect of albumin rescue on patient outcome in children with severe dengue .

Supervisor
Dr. Gurdeep Singh Dhooria
Professor
Dept. of Paediatrics

Co-Supervisor:-
Dr. Puneet A. Pooni
Prof. & Head
Dept. of Paediatrics

The student may submit the thesis in triplicate alongwith the plan in triplicate also, to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She may be directed to attach a photocopy of this letter with the forwarding letter while submitting thesis in the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic, if any.

Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*

EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED IN

PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MD

IN

PAEDIATRICS

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

DR. AMANDEEP KAUR

JULY, 2022

DEPARTMENT OF PAEDIATRICS
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE
For the degree of	MD PEDIATRICS
Name of the candidate	Dr. Amandeep Kaur
Supervisor	Dr. Gurdeep Singh Dhooria, Professor, Department of Pediatrics, DMCH, Ludhiana
Co-Supervisor	Dr.Puneet A Pooni,Professor & Head, Department of Pediatrics, DMCH, Ludhiana
Institution	Dayanand Medical College and Hospital,Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Severe Dengue is characterized by a vasculopathy during critical phase of the disease, with the plasma leak and hemoconcentration, causing intravascular volume depletion. Initialy it leads to compensated shock with signs of tissue hypoperfusion and decreased pulse pressure with preserved systolic blood pressure but later followed by life threatening hypotensive shock. Haemorrhage, from git and rarely from myocarditis can contribute to circulatory shock.

Management of patients with severe dengue mainly involve early recognition of shock and haemorrhage, serial cardiorespiratory monitoring and carefully guided volume resuscitation. Colloids are preferred over crystalloids in patients with refractory shock because of their ability to expand intravascular volume. Albumin has several other properaties along with oncotic properties. So we plan to study the effect of Albumin infusion on patient outcome in children with severe Dengue.

Aims and Objectives: PRIMARY OBJECTIVE:- Survival Benefit in patients with severe dengue treated with standard treatment plus Albumin compared to standard treatment alone.

SECONDARY OBJECTIVE:-Reduction in hct after 24 hours of treatment,,Reduction in hospital stay.

Materials and Methods: This will be a comparative ambispective interventional study which will be conducted in the department of Pediatrics, Dayanand Medical College and Hospital, Ludhiana. All the children with Severe Dengue with indication for colloids therapy admitted in Paediatrics Department will be taken in the study after taking due consent.

Clinical significance: After this study, we will be able to know the effect of Albumin infusion in severe dengue patients with shock, whether the infusion can cause significant differences in mortality and morbidity of severe dengue patients with shock.

Keywords: Mechanical ventilation, Compliance, Pediatric intensive care, duration of ventilatory support, PICU stay, Mortality.

(Signature) Candidate	(Signature) Co-supervisor	(Signature) Supervisor	(Signature) Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE"** exist in the Department of Pediatrics at Dayanand Medical College and Hospital, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis are genuine and is collected by the candidate herself under our supervision and guidance.

Supervisor

Dr. Gurdeep Singh Dhooria
Professor
Department of Pediatrics
DMCH, Ludhiana

Co-Supervisor

Dr. Puneet Aulakh Pooni
Professor & Head
Department of Pediatrics
DMCH, Ludhiana

Head of the Department

Dr. Puneet Aulakh Pooni
Professor & Head
Department of Pediatrics
DMCH, Ludhiana

Place : _____

Date : _____

APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Amandeep Kaur
Department	Pediatrics
Topic of Thesis	EFFECTS OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE
Likely date of appearing in PG examination	March,2025
Date of enrollment	5th March 2022
Name of Head of Department	Dr. Puneet Aulakh Pooni
1) Supervisor **2) Co-Supervisor**	Dr. Gurdeep Singh Dhooria Dr. Puneet Aulakh Pooni
Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
Dr. Harpreet Kaur (Professor & Head, Pathology)	Mr. R K Sharma (Legal Expert)
Dr. Jaspal Singh (Professor & Head, Surgery)	Dr. Ramit Mahajan (Associate Professor, Gastroenterology)
Dr. Dinesh Gupta (Professor & Head, Medicine)	Dr. Anu Sharma (Professor, Anatomy)
Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)	Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)
Dr. Gurpreet S Wander (Vice Principal)	Dr. Gurpreet S Wander (Vice Principal & Professor & Head, Cardiology)
	Dr. Gagandeep Singh (Secretary, Ethics Committee Professor & Head, Neurology)

Approved: Yes / ~~No~~

Dr. Sandeep Puri
Chairperson
Research Committee

Chairperson
Research Committee

Approved: Yes / ~~No~~

Prof. Arvind Malhotra
Chairperson
Ethics Committee

Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	Dr. Amandeep Kaur Village Seona, dist.Patiala, Teh. Patran, Punjab
2	NAME OF THE INSTITUTE	Dayanand Medical College and Hospital, Ludhiana
3	COURSE OF STUDY AND SUBJECT	MD Paediatrics
4	DATE OF ADMISSION OF COURSE	05thMarch 2022
5	TITLE OF THE TOPIC	EFFECTS OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE.

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Dengue is most prevalent mosquito borne viral infection worldwide. Presenting features may range from asymptomatic fever to complications such as haemorrhagic fever and shock. Around 100 million cases of dengue fever (DF) and half a million cases of Severe dengue are estimated to occur annually[1]. Of those with Severe dengue, 90% are children less than 15 years of age.

The most dreaded complication of dengue infection, especially in children and young adults, is vasculopathy presenting as a systemic vascular leak syndrome[2]. Usually vasculopathy reverse spontaneously after 48 hours, but substantial loss of plasma during this time may potentially result in dengue shock syndrome. Plasma leakage is usually accompanied by thrombocytopenia[3] and hemostatic derangements that favor bleeding[4] in severe dengue patients with shock who fail to respond to fluid resuscitation, the possibility of occult bleeding should always be considered.

Severe leakage resulting in shock[5] is seen more frequently in children as compared to adults[6] due to higher intrinsic permeability of paediatric microvessels[7] along with immature haemostatic mechanisms to prevent cardiac decompenstion in view of volume depletion.

Outcomes of dengue infections are usually excellent, but mortality in severe dengue can be as high as 44%-72%[8]. Mortality in severe dengue is mainly due to fluid overload and malignant edema due to capillary leak. To avoid treatment related complications. WHO guidelines recommended early recognition of shock and haemorrhage, serial cardiorespiratory monitoring and carefully guided volume resuscitation. Prompt resuscitation of volume of circulating plasma is the cornerstone of therapy for severe dengue with shock[9]. For resuscitation, colloids are more effective in refractory shock as they increase plasma oncotic pressure, altering the flux of fluid across the capillary membrane and drain fluid back into capillary from the interstial space. So the World Health Organization (WHO) dengue management

guidelines recommend prompt infusion of 10–20 ml/kg crystalloid fluid boluses for children with established shock, followed by a tapering crystalloid fluid regimen supplemented by boluses of synthetic colloid solutions as necessary. As Fluid overload is common in hypotensive dengue patients who require large volume for shock reversal, so colloid rescue is suggested by WHO and centre for disease control and prevention in refractory shock as compared crystalloids where hemorrhage has been excluded.Typically, more than a third of pediatric DSS cases receive a synthetic colloid as part of their fluid resuscitation regimen. Colloid molecules are typically retained in the free-flowing plasma compartment for a period of time, evidenced by hematocrit dilution effects, before distributing more widely across the body fluid compartments.[10,11] Among colloids, International guidelines typically recommend the use of albumin for resuscitation when crystalloids seems inadequate.[12]

Among colloids albumin has multiple roles along with oncotic properties. A strategy using Albumin rescue has been shown to show decrease fluid overload and mortality in severe burn shock, a condition which shares similar pathophysiology of extensive capillary leak and risk of compartment syndrome as in severe dengue. In septic shock benefits of albumin include support of disrupted glycocalyx, better safety profile and less complications as compared to other synthetic colloids. But the role of 20%/25% albumin to manage malignant edema and prevent treatment morbidity in severe dengue patients have not been fully described yet.

6.2 REVIEW OF LITERATURE

There is a convincing rationale for the potential advantages of albumin administration during severe sepsis.[13] Albumin is the main protein responsible for plasma colloid osmotic pressure[14]; it acts as a carrier for several endogenous and exogenous compounds,[15] with antioxidant and anti-inflammatory properties, and as a scavenger of reactive oxygen[16,17] and nitrogen[18] species and operates as a buffer molecule for acid–base equilibrium[19].

Studies confirm that administration of albumin produces small but significant hemodynamic advantages[20]. The average cardiovascular SOFA subscore over the course of the study period was lower in the albumin group, and the time to the suspension of inotropic or vasopressor agents was shorter, indicating a decreased use of vasopressors. These findings confirm a physiological advantage of albumin administration during severe sepsis, including a larger fluid distribution within the intravascular compartment and, in addition, possible effects of albumin as a scavenger of nitric oxide, mediating peripheral vasodilatation during sepsis.[21,22]

A subsequent network meta-analysis focused on acute resuscitation of patients with sepsis or septic shock and found that HES resulted in higher risk of death (10 RCTs; OR 1.13; CrI, 0.99–1.30; high-quality evidence) and need for RRT (7 RCTs; OR 1.39; CrI, 1.17–1.66; high-quality evidence) compared to crystalloids. When comparing albumin to HES, albumin resulted in lower risk of death (OR 0.73; CrI, 0.56–0.93; moderate-quality evidence) and a trend towards less need for RRT (OR 0.74; CrI, 0.53–1.04; low-quality evidence)[23].

In accordance with literature, Suchitra Ranjit et al conducted a prospective observational study, to determine the effect of proactively applied targeted interventions on mortality, positive fluid balance, ventilator requirements, PICU days and mortality as compared to matched retrospective cohort with severe dengue who received standard therapy as per WHO guidelines. Early albumin infusion for crystalloid refractory shock was one of the intervention. As per results the ST+ group had significant reduction in fluid overload and less

positive fluid balance on days 1-3. A significantly less number of ST+ patients required intubation, IPPV and invasive percutaneous drainage for symptomatic abdominal compartment syndrome.

A study comparing the effects of albumin and crystalloid on mortality in adult patients with severe sepsis and septic shock by Jng-Yuan Xu et al[24] it shows significant difference in 90 day mortality in severe sepsis patients resuscitated with albumin compared to crystalline and saline.

Another randomized trial conducted by Simon finfer et al[25] comapring albumin and saline for fluid resuscitation in intensive care unit shows low mortality in albumin group, but there was no significant difference between the groups in the mean number of days spent in ICU, days spent in hospital, days of mechanical ventilationor, days of renal replacement therapy

Role of albumin as a resuscitation fluid for patients with sepsis, another study by Delaney et al[26] reports the use of albumin containing solutions for resuscitation of patients with sepsis was associated with lower mortality compared to other fluid resuscitation regimens.

Furthur Vincet et al[27] studied the morbidity in hospitalized patients receiving human albumin. A randomized controlled trial which shows that albumin reduces morbidity in acutely ill hospitalized patients.

The SAFE Study[28] showed that the infusion volume in the normal saline group was 1.4 times higher than that in the albumin group, indicating that albumin has superior efficacy for the maintenance of blood volume. But the safety of human serum albumin solution is comparable to that of saline for resuscitation however albumin use may improve prognosis of patients with severe sepsis.

A large randomized controlled trial, the Albumin Italian Outcome Sepsis (ALBIOS) trial[29], 1818 patients with sepsis were divided into groups treated with crystalloids alone and a subgroup trated with both crystalloids and 20% albumin solution. Mortalities of two groups were similar but a subgroup of patients with septic shock showed a decrease in mortality among patients treated with albumin.

Furthur in a comprehensive meta-analysis of critically ill patients from 90 cohort studies, hypoalbuminemia was evaluated as an outcome

predictor. Results showed that for every 10g/L decrease in the serum albumin concentration, the length of hospital stay, incidence of comorbidities, and mortality rate increase by 71%, 89%,137% respectively.

In the same ALBIOS trial, the 90 day mortality was significantly elevated in patients with severe sepsis with a serum albumin level of less than 30g/L at the time of admission.

From the summary of information collected above, it can be concluded that there is an absence of solid evidence to indicate that albumin(compared to crystalloids or other plasma expanders) can reduce the risk of mortality and organ dysfunction when used in the resuscitation of severe dengue patients who are hemodynamically unstable.

6.3 AIMS AND OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVE:-Efficacy of 20%/25% Albumin plus standard treatment compared to standard treatment in patients with severe dengue with respect to mortality.

SECONDARY OBJECTIVE:-Reduction in hct after 24 hours of treatment

- Degree of volume overload
- Duration of PICU stay
- Duration of hospital stay
- Need for invasive ventilation and duration if required
- Need for inotropic support
- Need for platelet transfusion
- Need for packed cell transfusion
- Need for diuretics

7. MATERIALS AND METHODS

This is an comparative ambispective interventional non-randomized study which will be conducted in Department of Paediatrics, Dayanand Medical College and Hospital, Ludhiana. All the patients who have diagnosed with Severe Dengue, will be taken as subjects after taking consent from each patient for the same. Patients are divided into two groups-

STANDARD TREATMENT PLUS(Prospective cohort)-Severe Dengue patients with shock who receive 20%/25% Albumin infusion along with standard treatment as per WHO guidelines.

STANDARD TREATMENT(Retrospective cohort)-Severe Dengue patients with shock who receive standard treatment as per WHO guidelines.

This study will be conducted after taking approval from the Institutional Ethics committee.

7.1 Source of Data:

Patients 0-18 years, diagnosed with Severe Dengue in Department of Paediatrics, Ludhiana.

7.2 METHOD OF COLLECTION OF DATA

Data would be collected from consenting participants meeting inclusion criteria after briefing them about the purpose of study.

The proforma consists of demographic details of the participants, details of presenting complaints, primary diagnosis to treatment given and investigation during period of admission. A structured proforma based on objectives of study will be designed to assessthe outcomes of treatment given in patient.

INCLUSION CRITERIA:

1. Patients between 0-18 years of age, diagnosed with Severe Dengue.
2. Severe dengue patients who have received IV fluid resuscitation and have following indications for using colloidal solution:-Shock and no response to crystalloid resuscitation.

3. Patients whose parents willing to give consent

EXCLUSION CRITERIA:

- Patients > 18 years of age
- Severe Dengue patients with underlying co-morbidities.
- Non-consenting patients or attendants

OUTCOME

In this study we propose that resuscitation with 20%/25% albumin help in better hemodynamic stability, thus reducing both mortality and morbidity in severe dengue patients.

SAMPLE SIZE CALCULATION:-

By using previous study (suchitra ranjit et al), the mortality rate is 26% in Standard treatment and 2.6% in 25% albumin with standard treatment(standard treatment plus)

Based on this assumption

The formula used in the situation is as under:

$n = [Z\ 1-\alpha/2\ \sqrt{2}\ P\ (1-P) + Z\ 1-\beta\ .\sqrt{\{P1(1-P1) + P2\ (1-P2)\}}]2$

$(P1-P2)\ 2$

Where $P=(P1+P2)/2$

• Approximate value of efficacy/cure rate for standard treatment =P1

• Approximate value of efficacy/cure rate for standard plus treatment = P2

• Effect size = (P2-P1)

Level of significance (usually 5%)

• $Z\alpha$ = Value of standard normal variate corresponding to α level of significance (1.96)

$Z\beta$ = The standard normal deviate for desired power(0.842)

With the above assumptions the sample size for 95% confidence level & 80% power works out 32 in each group.

STATISTICAL ANALYSIS:-

Data will be described in terms of range; mean ±standard deviation (± SD), median, frequencies (number of cases) and relative frequencies (percentages) as appropriate. To determine whether the data is

normally distributed, a Kolmogorov-Smirnov test will be used. Comparison of quantitative variables between the study groups will be done using Student t-test and Mann Whitney U test for independent samples for parametric and non-parametric data respectively. For comparing categorical data, Chi square ($\chi 2$) test will be performed and fisher exact test will be used when the expected frequency is less than 5. A probability value (p value)less than 0.05 will be considered statistically significant.All statistical calculations will be done using (Statistical Package for the Social Science) SPSS 21version (SPSS Inc., Chicago, IL, USA) statistical program for Microsoft Windows

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

Investigations to be conducted on patients-

- Blood- CBC, LFT, RFT, CRP, Coagulation profile,
- Lab diagnosis of dengue
- Radiology- Chest X-ray, USG Abdomen

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith

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PROFORMA (STANDARD TREATMENT PLUS)

Sr. No.

Name: - **Age: -**

Sex: - **MRD NO.**

Date-

Anthropometry

	Actual	Expected	Interpretation
Weight			
HC			
Height			
BMI			

Chief complaints

Duration of illness:-……

Febrile/Afebrile phase:-……..

DETAILED CLINICAL ASSESSMENT-

AIRWAY **- Open & Stable** **Open but Unstable** **Obstruction**	**BREARHING RR,...../Min** **Efforts-Normal Poor/Increased Acidotic** **Air Entry-- Normal Poor Differential** **Auscultation -None Stidor**	**CIRCULATION HR... Min** **CFT..... BP..** **Central Pulse Good Poor** **Peripheral Pulse**

Signature of Candidate **Signature of Supervisor**

	Wheeze Crackles **SpO, (room air).....** **Spo, (On oxygen).....**	**Good Poor** **Skin Temp Warm** **ECG: Rhythm** **T-wave……** **Others…….**
E V M **Pupil size ……** **Motor Activity Normal & symmetrical** **Asymmetrical Seizures** **Posturing Flaccidity** **extrapyramidal movements**	**EXPOSURE** **Color Normal Pallor Cyanosis Ashen Grey Skin** **Surface Findings Rash Abscess Pustules** **Cellulitis PatechiePurpure Ecchymosis** **Hemorrhagic nodules Mucosal ulcers**	

Final Physiological impression:

Stable

Tachypnea

Respiratory distress

Respiratory failure

Compensated shock

Hypotensive shock

Cardiopulmonary failure

Primary Brain/Metabolic Dysfunction

EXAMINATION

Pallor **Icterus**

Cyanosis **Clubbing**

Signature of Candidate **Signature of Supervisor**

Edema **Lymphadenopathy**

SYSTEMIC EXAMINATION;

CHEST-

CVS-

ABDOMEN-

CNS-

DIAGNOSIS

Diagnosis of Dengue fever based on-

- **NS1 Ag** **IgM ELISA** **Clinical Diagnosis**

CRITERIA FOR SEVERE DENGUE

- **Severe plasma leakage leading to**

-shock-Y/N

-fluid accumulation with respiratory distress-Y/N

-Severe bleeding-Y/N

-Severe organ involvement

- **Liver AST/ALT ratio>1000- Y/N**
- **CNS impaired consciousness- Y/N**

Signature of Candidate **Signature of Supervisor**

- **Failure of heart and other organs- Y/N**

COMPLICATIONS OF DENGUE

- **Evidence of fluid overload-Y/N**
- **Bleeding- Y/NSite-Nose/oral cavity/GIT/hematuria**
- **Superadded infection-Y/N**
- **Renal dysfunction- Y/N**
- **Need for dialysis- Y/N**
- ✓ **Any comorbidities-**

- ✓ **Need for PICU Admission:**
- ✓ **PRISM SCORE:**

INVESTIGATIONS

Hct (at admission)-

Hct (after 24h of albumin)-

Fall in hct after 24h-

Dates				
Hb **TLC** **DLC** **Platelets** **PTI/INR** **SGOT** **SGPT** **Serum Urea**				

Signature of Candidate **Signature of Supervisor**

Serum Creatinine				

Chest Xray- Pleural effusion/Consolidation/Edema

USG-Ascites

MANAGEMENT OF SEVERE DENGUE

- **NS BOLUS**

  1……
  2……
  3……
  4……
  TOTAL…….

- **..... ALBUMIN INFUSION (ON DAY OF ADMISSION)**

  ……..
  ……..
  ……..

- **COLLOID BOLUS (GELEFUSION)**

  1……
  2……
  3……
  4……
  TOTAL…….
- **INPUT -OUTPUT**

Signature of Candidate **Signature of Supervisor**

	INPUT	OUTPUT
DAY 1		
DAY 2		
DAY3		

OUTCOMES OF TREATMENT

1.Positive Fluid Balance

Day1-……

Day2-……

Day3-……

Grand PFB-……

2.Need for oxygen-Y/N

Days-…….

3. Need for oxygen:Y/N

Days-……..

4.Noninvasive ventilation:Y/N

Days-…….

5.Mechanical ventilation:Y/N

Days-……..

6.Inotropes:Y/N

Days- .....

Inotropic score .....

Vasoactive Inotropic score .....

Inotropic score = Dopamine dose (ug/kg/min) + Dobutamine dose (ug/kg/min) + 100 X Epinephrine dose (ug/kg/min)
Vasoactive-Inotropic score(VIS)=IS+10 x PDE Inhibitor (milrinone or olprinone)dose (ug/kg/min)

Signature of Candidate **Signature of Supervisor**

+100 X norepinephrine dose (ug/kg/min) +10000 X vasopressin dose (U/kg/min)

7.Abdominal drain:Y/N

Days-……..

8.Major bleeding:Y/N

Site……..

9.Pleural tap:Y/N

days …….

10.Need for packed cells transfusion:-Y/N No…….

11.Need for platelet transfusion:-Y/N No…….

12.Dialysis :Y/N

Days……

13.Diuretic:Y/N

14.Lasix Infusion: Y/N

Albumin Complication:-

Pulmonary edema

Hypertension

Hypertension with seizure

Signature of Candidate **Signature of Supervisor**

PROFORMA (STANDARD TREATMENT)

Name: - **Age: -**

Sex: - **MRD NO.**

Date-

Anthropometry

	Actual	Expected	Interpretation
Weight			
HC			
Height			
BMI			

Chief complaints

Duration of illness:-……

Febrile/Afebrile phase:-……..

DETAILED CLINICAL ASSESSMENT-

AIRWAY **- Open & Stable** **-Openbut Unstable** **-Obstruction**	**BREARHING RR,...../Min** **Efforts-Normal** **Poor/Increased Acidotic** **Air Entry-- Normal Poor Differential** **Auscultation -None Stidor Wheeze Crackles** **SpO, (room air).....**	**CIRCULATION HR... Min** **CFT..... BP..** **Central Pulse Good Poor** **Peripheral Pulse Good Poor** **Skin Temp Warm** **ECG: Rhythm**

Signature of Candidate **Signature of Supervisor**

	Spo, (On oxygen).....	**T-wave…… Others…….**
E V M Pupil size …… Motor Activity Normal & symmetrical Asymmetrical Seizures Posturing Flaccidity extrapyramidal movements	**EXPOSURE Color- Normal/ Pallor/ Cyanosis/ Ashen Grey Skin Surface Findings- Rash/ Abscess/ Pustules Cellulitis /Patechie/Purpure/Ecchymosis Hemorrhagic nodules/ Mucosal ulcers**	

Final Physiological impression:

Stable

Tachypnea

Respiratory distress

Respiratory failure

Compensated shock

Hypotensive shock

Cardiopulmonary failure

Primary Brain/Metabolic Dysfunction

EXAMINATION

Pallor **Icterus**

Cyanosis **Clubbing**

Edema **Lymphadenopathy**

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SYSTEMIC EXAMINATION;

CHEST-

CVS-

ABDOMEN-

CNS-

DIAGNOSIS

Diagnosis of Dengue fever based on-

- **NS1 Ag IgM ELISA Clinical Diagnosis**

CRITERIA FOR SEVERE DENGUE

- **Severe plasma leakage leading to**

-shock-Y/N

-fluid accumulation with respiratory distress-Y/N

-Severe bleeding-Y/N

-Severe organ involvement

- **Liver AST/ALT ratio>1000- Y/N**
- **CNS impaired consciousness- Y/N**
- **Failure of heart and other organs- Y/N**

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COMPLICATIONS OF DENGUE

- **Evidence of fluid overload-Y/N**
- **Bleeding- Y/NSite-Nose/oral cavity/GIT/hematuria**
- **Superadded infection-Y/N**
- **Renal dysfunction- Y/N**
- **Need for dialysis- Y/N**
- ✓ **Any comorbidities-**

- ✓ **Need for PICU Admission:**
- ✓ **PRISM SCORE:**

INVESTIGATIONS

Hct (at admission)-

Hct (after 24h of albumin)-

Fall in hct after 24h-

Dates				
Hb **TLC** **DLC** **Platelets** **PTI/INR** **SGOT** **SGPT** **Serum Urea** **Serum Creatinine**				

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Chest Xray- Pleural effusion/Consolidation/Edema

USG-Ascites

MANAGEMENT OF SEVERE DENGUE

- **NS BOLUS**
  1……
  2……
  3……
  4……
  TOTAL…….

- **COLLOID BOLUS (GELEFUSION)**

  1……
  2……
  3……
  4……
  TOTAL…….

- **INPUT -OUTPUT**

	INPUT	OUTPUT
DAY 1		
DAY 2		
DAY3		

OUTCOMES OF TREATMENT

1.Positive Fluid Balance

Day1-……

Day2-……

Day3-……

Grand PFB-……

2.Need for oxygen-Y/N

Days-…….

3. Need for oxygen: Y/N

Days-……..

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4. Non invasive ventilation: Y/N

Days-…….

5. Mechanical ventilation: Y/N

Days-……..

6.Inotropes:Y/N

Days- .....

Inotropic score .....

Vasoactive Inotropic score .....

Inotropic score = Dopamine dose (ug/kg/min) + Dobutamine dose (ug/kg/min) + 100 X Epinephrine dose (ug/kg/min)
Vasoactive-Inotropic score(VIS)=IS+10 x PDE Inhibitor (milrinone or olprinone)dose (ug/kg/min) +100 X norepinephrine dose (ug/kg/min) +10000 X vasopressin dose (U/kg/min)

7.Abdominaldrain:Y/N

Days-……..

8.Majorbleeding:Y/N

Site……..

9.Pleuraltap:Y/N

days …….

10.Need for packed cells transfusion:-Y/NNo…….

11.Need for platelet transfusion:-Y/N No…….

12.Dialysis :Y/N

Days……

13.Diuretic:Y/N

14.Lasix Infusion: Y/N

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INFORMED PATIENT CONSENT

Date: _____

I…….D/o, W/o, S/o……..…… am willing to participate in the study **"EFFECT OF ALBUMIN RESCUE ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

…… ……
Signature of the Witness Signature of the patient

Name:

Signature of Candidate **Signature of Supervisor**

मरीज अनुमति फार्म

तिथि _____

मैं _____ पत्नी/पुत्र/पुत्री _____
निवासी _____
इस शोधकार्य "**EFFECT OF 25% ALBUMIN ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE**" में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____	_____
गवाह के हस्ताक्षर	रोगी के हस्ताक्षर/अंगूठे का निशान
नाम:	नाम:

_____
अन्वेषक के हस्ताक्षर

_____
विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____

ਵਾਸੀ _____

“EFFECT OF 25% ALBUMIN ON PATIENT OUTCOME IN CHILDREN WITH SEVERE DENGUE” ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

_____ _____

ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

_____

ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____

ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ